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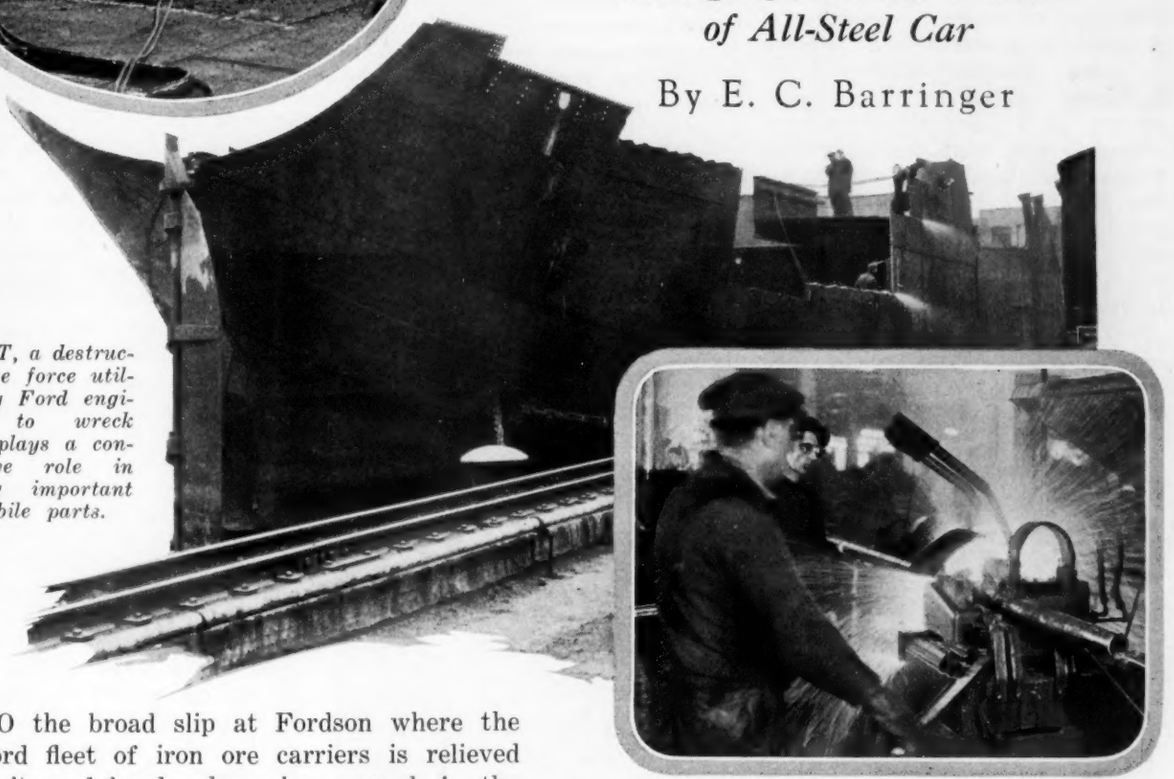
IRON TRADE REVIEW

Cleveland, O.
March 22, 1928

FORD BLAZES NEW TRAIL *In* Metalworking

Production Welding, Permitting Broader Use of Forgings and Stampings, Furthers Goal of All-Steel Car

By E. C. Barringer



HEAT, a destructive force utilized by Ford engineers to wreck ships, plays a constructive role in welding important automobile parts.

INTO the broad slip at Fordson where the Ford fleet of iron ore carriers is relieved of its red burden have been eased, in the past two years, nearly 200 surplus shipping board vessels—rusty and disspirited reminders of a war emergency happily past. Stripped of their gear and machinery, the hulks have been cut down and converted into scrap for charging in the Ford steel furnaces. In the process of demolition the cutting torch, burning inexpensive coke gas, has been a major reliance.

Hemming in this slip on three sides are those vast steel and glass structures, some a half mile long, in which 65,000 workmen are now swinging into production on the new model A. It is the

¶ *First of a series describing the unique metalworking processes developed or adapted by Ford Motor Co. in building its new automobile. Subsequent articles will explain details of unusual practice.*

pride of the Ford Motor Co. that it is not merely building a new car but a new kind of car. For, excepting the motor itself, the car is all-steel—a construction made possible by the utilization of steel stampings and steel forgings merged into a harmonious and efficient whole by electric welding.

There you have one of those contrasts that make Ford—the man, the organization, the car—a name to conjure by. The force—heat—that was developed to a high art in the destructive task of shipwrecking has been captured and directed to the constructive pursuit of building up automotive parts. Nor is it chance that much of the jagged steel slashed and burnt from the sides of ships built to succor armies has been reborn in the white heat of the open-hearth furnace and is being restored to a pacific use.

New construction demands new methods. To design a motor car of specified performance and lines is no mean task, but to develop the equipment requisite to the production of its parts economically and in volume is even more taxing. So the Ford organization, always with an all-steel car in mind, went back to first principles—and even revised some of these. Its mechanics, like its religion, it has posited on a trinity. Its credo is this:

Since man has utilized base metals he has been working chiefly from the mass down to the finished product. He has taken the mass and by various processes of machining and grinding reduced it. A mode always wasteful and sometimes not making for a maximum of strength.

Hundred Millionths of Inch Do Count

WITHIN the Ford Motor Co., as in Scotland, many a mickle makes a muckle.

There is the matter of accuracy in the orifices of cutting torches.

An engineer has calculated that if the diameter of the oxygen orifice is specified as 0.078 inches its area is 0.00477837 square inches. But should the drill be ground off center and cut larger or the reamer be oversize, an increase of as much as 0.002 inches in the diameter increases the orifice to 0.00502656 square inches and results in an increase of 5 per cent in the consumption of oxygen.

Or take a preheating flame orifice whose diameter is supposed to be 0.036 inches, and whose area is 0.00101787 square inches. Occasionally variations of 0.004 inches are discovered, and so small an increase enlarges the orifice to 0.00125664 square inches and 25 per cent more preheating oxyacetylene than is required passes through.

For economical production, both per piece and per man, no class of equipment equals that generically described as the punch press. Provided the operator is supplied with stock, each revolution of the press must result in a product. In the manufacture of parts, as in the assembly line, an inescapable pace can be set.

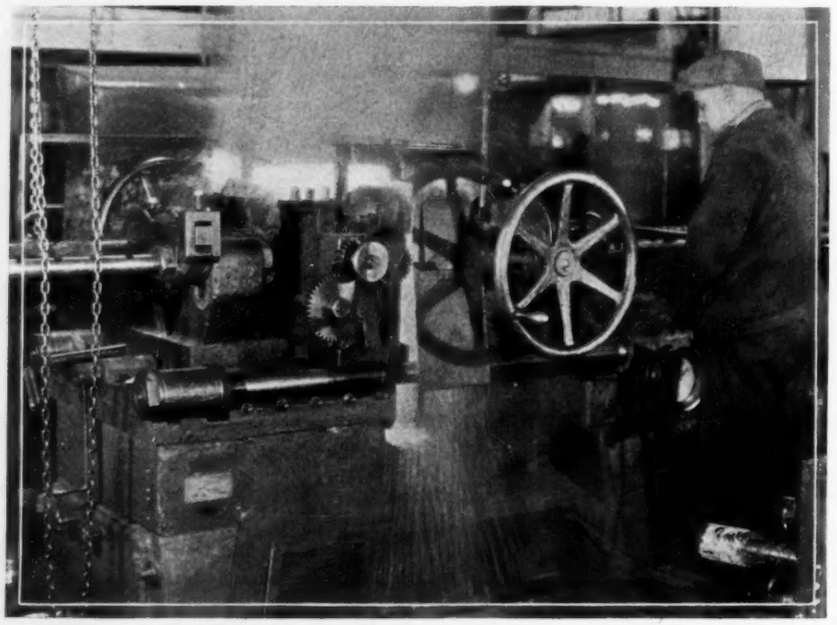
Applying these propositions to the problems peculiar to the automotive industry, the Ford organization perceived that many parts could be stamped or pressed or forged—which in Ford technology is virtually a punch press operation. At one stroke, for all practical purposes, it could obtain a maximum of efficiency in parts production and be constructive by working from components up instead of from the mass down. But how co-ordinate?

Enters welding, rounding out the trinity. By applying heat to metal under pressure the Ford organization began to see daylight. It could resort to forgings or stampings or pressed parts and, by welding, build up units that would be stronger, lighter and less costly than former design. And the units would have the further merit of being all-steel and integral.

So confident is the Ford organization that the marriage of stampings or pressed parts and forgings, with welding officiating, is a happy one that no small segment of the $100,000,000 by which the Ford bank account has shrunk since Model T was officially abandoned last May has been expended on methods and equipment of which electric welding is the arch. Here may be discerned one reason for the long gap between Models T and A. The modes of production are as different as the cars themselves.

Take the differential housing as an apt illustration of the new method. The banjo section in which the differential gears revolve is pressed steel to which the banjo neck is welded. To the section are bolted—for easy servicing—the axle shaft housing assemblies, one on each side. They in turn are built up of a piece of stock blanked and formed into a taper tube and arc welded longitudinally. To the large end is flash welded the bell flanged section, hot spun from steel blanks, which in assembly bolts to the differential housing. To the small ends are flash welded the two-piece welded forgings which provide the wheel bearings, flanged housings for the brakes and the perch for the transverse spring and shock absorber.

An inextricable union of forgings and pressed steel parts and welding! Contrasted with the rear axle housing of Model T, all overlapping of metal has been eliminated, with a heavier motor and car the rear housing assembly is 15 per cent lighter and 200 per cent stronger, tests to destruction reveal superiority for the all-steel housing, tolerances are narrower, and on a production basis unit costs are lower. When the all-steel housing does give, in destruction tests,



Over 800 miles of steel pipe, salvaged from the Ford ship scrapping operation, have been welded into 20-foot lengths for shop use

Key parts of new Ford, showing how welding makes possible broader use of forgings and pressed steel sections

the weld holds. The production of this housing, as of other key parts, will be described in detail later in this series.

Neither forging nor welding is an orthodox operation at Fordson, where production of parts and assembly of Model A is being concentrated. Swiftly-striking drop hammers only disturb the peace of the crank and cam shaft and smaller departments. Forging is a press operation, as will be related in further articles, whereby the heated blank is inserted in a die and pressure applied by a vertical forge press of the bulldozer type. No more skill is required than to insert the blank and step on a treadle. The operation being practically automatic, uniformity and volume are assured.

In welding, the work is speedily clamped in copper jaws, a pull on a lever effects the contact, a finger's pressure releases 6 volts, there is a modest burst of sparks and the weld is complete. This necessitates considerable training, but Ford engineers are fast eliminating the human element in welding by designing electrical and mechanical controlling devices. The fixtures assure perfect alignment and burning is practically impossible. Incidentally, much colored labor is employed in both forging and welding and no fatalities have resulted from the network of high-voltage lines.

As the superintendent in charge of welding operations sees it:

"There is no difference between the theory of the old-fashioned blacksmith weld and an electric resistance flash weld.

"The blacksmith put his steel in a forge and the heat was applied externally. The steel often absorbed impurities from the heating medium. When at the proper heat it was removed, the surfaces to be joined were cleaned of oxide, placed together and hammered vigorously. The actual welding was accomplished by heat plus pressure.

"In the electric resistance flash weld the heat comes from an arc drawn between the surfaces to be welded. As it will not heat sufficiently to weld quickly except through the resistance of the arc, it is necessary to have the pieces of uniform size or nearly so.

"The copper jaws supply the current to the piece to be welded and control the heat at the weld. Therefore, their distance from the weld should be uniform in all directions and on each piece.

"The amount of flashing of the metal is determined by experience, and if right has produced an area of metal in the two pieces to be joined that has been protected from the oxygen in the air and other im-

(*Continued on Page* 754)

Can Business Benefit from Principles of War?

Will Fundamental Rules of Combat Serve Manufacturers in Their Struggle with Competition? Strategy of Napoleon and Foch Has Application in Industry

By Robert E. Kinkead

Sixth Article

THE value of historical example in the study of the conduct of war is well established. In the light of dispassionate analysis, movements and strategic actions assume more nearly their true values than they do in the heat of action. Cause of victory and defeat may be more clearly seen in the perspective of time. Men's actions may be judged entirely on the basis of what they did rather than the confusion of impulses and thoughts which lead to the action. Since we are more interested in the result of certain actions than the thoughts which induced the actions, historical example is of great value in studying the principles which underlie the successful conduct of competitive enterprises.

The history of the rise and fall of industrial concerns is worthy of far more attention than has ever been devoted to it. Every manufacturer has observed competitive struggles between two or more companies in which one emerges eventually as the dominating factor in the field. If business executives would study these conflicts as carefully as military experts study the important campaigns of war, there would be less grief in business.

Background Is Cited

Let us consider the history of the development of an important branch of the metalworking machinery industry. The account is accurate, although the product and the identity of those concerned in its promotion are disguised. This history is typical of that of many machines selling for $500 or more.

In 1905 a new device was brought to this country from Europe. It made possible a certain important metalworking operation which had not been employed in America up to that time. The new equipment was placed in service in the vicinity of New York and won prompt favor because it performed its work quickly and at low cost. The economy over other methods was easily apparent.

The original group of men who brought the equipment to this country, appreciating the value of the service rendered, first sold the service of the equipment at extremely profitable rates. Later they sold the equipment itself at very high prices. Yet in spite of the high prices charged for either the service or the machines, people were glad to pay because the economies effected were so large that the high prices were actually low in relation to the benefit received.

This price policy made competition more certain. It held out the inducement of enormous profits for competitive effort.

By 1910 four machinery manufacturers in this country were in the market with similar machines with which substantially the same results could be obtained. The prices had started at substantially the prices of the European equipment, but had gradually dropped to much lower levels due to competition between manufacturers. Three of the American competitors had machines which were more efficient in the use of power than the European machine. One American manufacturer had a machine which was far more efficient for certain work than his American competitors. The European competitor held to his prices, and in the field in which he operated maintained a dominating position.

The American competitors made every effort to get the business away from the European group, but were unsuccessful because the American competitors did not know enough about the use of the process to get satisfactory results with it. This situation lead to the spread of the process into other fields of work. Such action became necessary for the American competitors if they were to sell their equipment, since they could make no headway against the group which had had experience in the original field. As soon as one of the American competitors would develop a new industrial application, the other American competitors would promptly enter that field and fight for the business.

One American competitor, in view of the ramifications of the business, decided to place his equipment in the hands of an agent for distribution. The agent had several men who were said to have learned the business from the original European group and it would be reasonable to suppose that with this experience available the other American competitors could be outdistanced. This agent, however, proved to be possessed of far greater enthusiasm than experience and within a year had succeeded in "selling" about 50 machines which had been guaranteed to give "satisfaction." Of the 50 machines "sold" on this basis, some 40 came back to the manufacturer with the statement that they were "not satisfactory."

Similar Conditions Existed

In the meantime, the other American competitors had been having the same experience on a smaller scale. People had heard of the new process and were willing to try it. In an excess of enthusiasm the manufacturers thought that practically anything could be accomplished with it. Equipment would be installed on practically any basis with the agreement to demonstrate that it would prove advantageous; in fact, that the manufacturer would prove to the prospective buyer that he could not afford to be without it at any price. A good deal of the early enthusiasm on the part of the machinery manufacturers for the sale of the machine was lost due to the high percentage of returned equip-

ment. By 1913 all the American competitors in the field had reached the point at which there was no outstanding success discernible among them.

At the beginning of 1914 one of the American competitors developed a machine which was much superior to anything which had been offered on the market up to that time. This was the competitor who had tried out the proposition of having the agent handle the machines. This time he went at the job in a different way. He went to the prospective buyer and told him everything which he, the manufacturer, thought could be accomplished with the process. When the prospective buyer asked the price of the equipment he was told that it was not for sale until it had been proven, but that he, the purchaser, could rent the equipment until the facts were proven. The rental charge was to constitute the entire obligation. The purchaser could by this arrangement satisfy himself without moral obligation to the manufacturer as to the merits of the equipment. The equipment could be bought at the end of 30 days and the rental would apply on the purchase price.

This rental plan of handling the equipment was an instant success. Steadily this American competitor forged ahead of his opposition with his new equipment and his new plan of allowing the purchaser to try out the equipment at his own cost and on his own responsibility. The plan appeared to be what the prospective purchaser wanted. At the outset, 10 per cent to 15 per cent of the outfits came back. After the first two years, by more careful selection of prospects, this was reduced to 4 per cent. By 1918 this competitor had reached a dominating position. Four additional competitors had entered the field but were unable to shake the grip of the leading competitor.

In 1918 other large competitors brought out improved machines similar to the dominating competitor's type of equipment. The first of these new machines were not successful. It was thought that the grip of the successful American competitor could be broken by offering to put the machines in for trial purposes without cost to the prospective purchaser. This was partially successful.

At this period the dominating competitor instituted a national advertising campaign which was kept up steadily. None of the other competitors had undertaken a national advertising campaign up to this time. He also took definite steps to get the good will of the craftsmen operators. The operators constantly boosted his equipment and furnished prospects.

The distinguishing differences between the dominating competitor and the remainder of the field were, at this time:

1. He installed the equipment on a rental basis, leaving it up to the prospective purchaser to prove its merits.

2. He had developed men and located them in all industrial districts who were able to place the equipment where it would most likely prove economical and would be purchased. These men became specialists whose recommendations were based on wide experience as distinguishd from the competition's men who were salesmen who handled many lines of equipment in addition to the equipment in question.

3. He played to the operators to get goodwill and new prospects.

We may now digress for a moment from the dominating factor in the field and consider the meteoric career of one of the smaller competitors.

Visualizes Possibilities

This smaller competitor, whom we will give the name of Brown, saw the possibilities of using the process. He developed a machine and tried it out in the plant where he had been employed. Using his wide circle of acquaintances he attracted a great deal of attention and sold a considerable amount of his equipment. He knew more about one specialized field than any of the other competitors and in spite of their strenuous efforts none of them could make any headway against him.

At about this time a war-time emergency developed an unusual opportunity for the use of the process. A group of Brown's friends were called on to give expert advice. They found a method of using Brown's machines to meet the emergency. The government authorities ordered the work done without delay and Brown's machines were used almost exclusively. The work was well done and a great service was performed for the allies.

Patriotic enthusiasm for this technical service was great, and in the hands of fairly skilful publicity men Brown's machines and organization were welcomed with open arms by prospective purchasers of this type of equipment. For about a year Brown could have beaten any competition in the field and did win practically every time he encountered competition. However, during the period of 1918 and 1919, public interest was at such a pitch on the subject that Brown's organization was entirely inadequate to reach the prospects as rapidly as they appeared.

In the meantime, his equipment had been widely distributed and users had an opportunity to compare its performance with the performance of other equipment. The results of such comparisons were in most cases unfavorable to Brown's equipment. By 1922 Brown's equipment was no longer a factor in the main competitive field. Several years later important improvements were made in the equipment and its position was never regained.

Bringing the history down to the present we find the field occupied by about 15 active competitors with about $5,000,000 worth of business placed annually. The dominating competitor still dominates, although he sells a steadily decreasing percentage of the total equipment sold in this country. All special means of getting the prospective buyer to install equipment have been done away with. The dominating factor has done away with the idea of the specialists who sell the equipment. He handles the equipment through salesmen who sell other products. All of the important competitors in the field handle the equipment in the same way.

Each of the important competitors has reduced the cost of manufacturing the equipment to the lowest point consistent with good performance. Universal specifications on rating, and the like, have been adopted by manufacturers, so that the buyer will have a basis of price comparison. That new history is in the making is indicated by the impotence of the field to halt the leveling off process by which competition becomes purely a matter of price comparison.

Metalworking Industries Dominate Ohio Wages

Ranking industries of Ohio in importance on the basis of total wage and salary payments, the *Bulletin of Business Research*, of Ohio State university, Columbus, O., shows that of the ten leaders, four are metalworking. According to Ohio division of labor statistics steel works and rolling mills rank first, with a pay roll of $164,756,000 in 1925. Following were stores, retail and wholesale, with $157,576,000 pay roll; foundries and machine shops, $153,415,000; tires and tubes, $92,988,000; automobiles and parts, $92,971,000; general contracting, $58,509,000; coal mining, $41,057,000; offices, $41,022,000; printing and publishing, $39,769,000, and electrical machinery, $35,465,000. A sharp recession in employment during the last few months of 1927 was more marked in the iron and steel group than in foundries and machine shops.

Applies Vacuum Principle To Making of Castings in Permanent Molds

By Edwin Bremer

ALTHOUGH the vacuum process has been suggested on numerous occasions as an ideal method of obtaining solid castings free from gases, blowholes and other defects, it is only recently that it has been developed commercially. Experience gained in the forming of glass through use of the vacuum principle led to attempts to apply the process to the molding of metals. The result is that today lead storage-battery grids are being manufactured by this method on a quantity production basis.

August Kadow, chief engineer, Owens Bottle Co., and vice president, Vacuum Castings Co., Toledo, O. invented a machine to produce electric light globes. The molten glass is drawn into molds by means of a vacuum. After perfecting the process for glass, he attempted to apply it to the production of metal castings.

Many difficulties not present in forming glass were encountered in handling metal, but after considerable experiment, Mr. Kadow devised a machine employing the vacuum principle and performing all operations automatically. These operations consist essentially of opening the vacuum line, dipping the ingress or gate end of the mold into the molten metal, allowing the proper time for solidification, opening the mold and ejecting the finished casting, cooling the mold, smoking the joints to make a proper seal for the vacuum, brushing out any loose particles of soot, and closing and clamping the mold for the next dip. The completed machine is shown in Fig. 1. Only two of the 12 mold-carrying arms is shown in this view. The machine is 10 feet 3 inches in diameter and weighs between 10½ and 11 tons. The pillar carrying the arms which move in a circular path, is rotated by a 3-horsepower electric motor.

Motions of the various parts of the machine such as dipping the mold in the metal bath, opening the vacuum line, etc., are controlled by combination roller and cam actions. The gate end of the mold is immersed in the molten metal. This action is controlled by a roller on the lower part of the machine. This roller moves between two guides which are plainly shown at *B* in the lower part of the central cylinder in Fig. 1. At various points these guides have dips, as may be seen in the illustration. As the roller follows the dip, it lowers the arm and this in turn lowers the mold into the metal.

Just before the mold is immersed in the metal, the vacuum line is opened by the roller operated from the cam. As the roller strikes the cam it is forced out and this motion

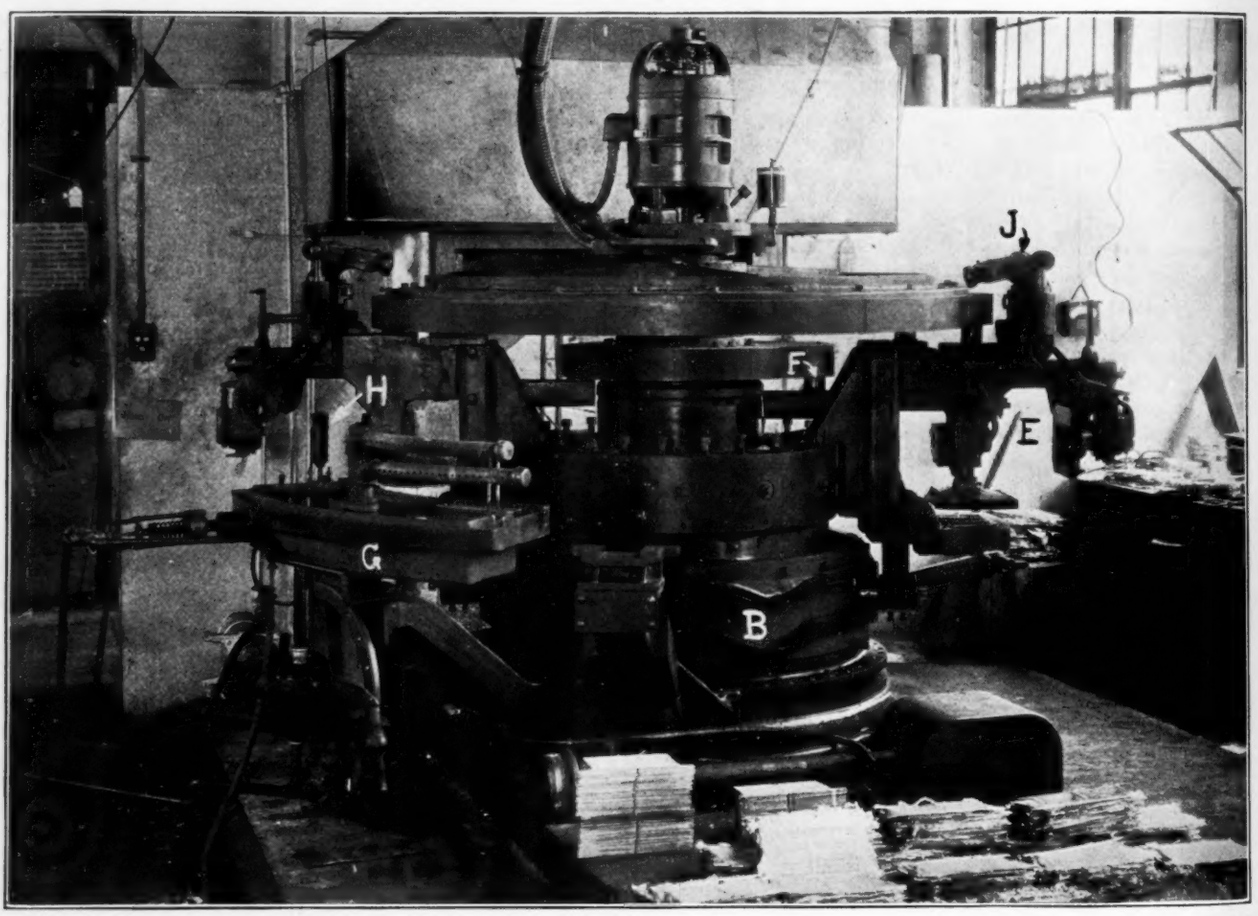


Fig. 1—View of vacuum molding machine showing thermostatically controlled water cooling bath at left and mold ejecting a finished casting at right

Typical Lead Castings Produced in Automatic Vacuum Molding Machine

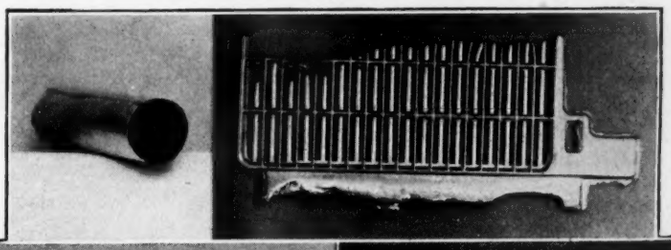
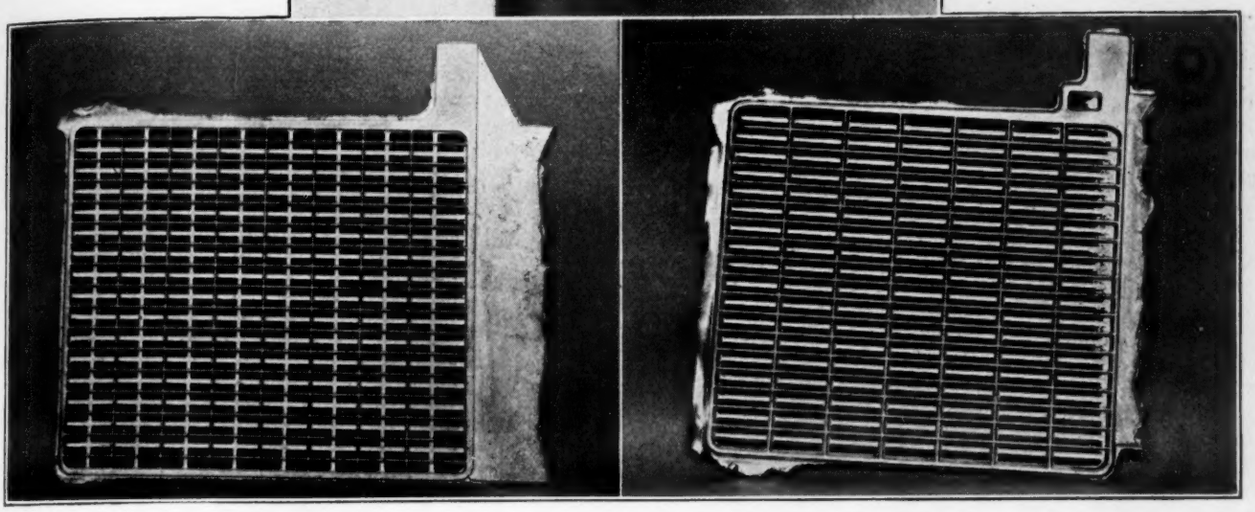


Fig. 2 (Top)—Small tubular casting made by vacuum process. Fig. 4 (Bottom)—Battery grid

Fig. 3 (Top)—Casting made by decreasing vacuum, thereby filling only part of mold. Fig. 5 (Bottom)—Battery grid



is transmitted by a system of levers to the spring controlled valve which opens the vacuum line. Just above the spring valve is a small cylindrical drum with a knurled nut at the end. This is for adjusting the amount of vacuum. The valve contains a slotted opening graduated from ⅛-inch to ⅛-inch. The position of the slot determines the width of opening and consequently the amount of vacuum; the narrow opening decreasing the vacuum and the wider increasing it.

A brickwork chamber serves as a heating chamber for the iron pot containing the molten metal. The temperature of the metal bath is maintained at an even level through thermostatic control. Another furnace is used as a reservoir, in which the metal is kept just molten, and through a system of floats and levers, metal from the reservoir is admitted to the bath at the machine when the level falls below a predetermined point.

On the right at *E*, the mold is shown open just after ejecting a casting. A number of the castings which are lead, storage-battery grids, are shown in the foreground. The opening of the mold is controlled by the roller eccentric *F*. As the arm reaches this point in its rotation, the eccentric forces a rod in the arm proper forward. The opposite end of this rod contains rack teeth which engage a pinion attached to the inside half of the mold.

As the rod and its rack teeth move forward, the mold half opens and swings downward. A small projection at some unimportant place on the mold face causes the finished casting to stick to that half of the mold as it is opened. However, when the mold face is horizontal the projection does not exert any holding power and the casting drops down. After the casting is ejected, the eccentric action brings the two mold faces vertical but not together. In this position the two halves of the mold pass through the cooling bath which contains water. Fig. 1 shows the mold passing through the cooling bath. The temperature of the cooling bath is controlled thermostatically. The water bath chamber may be raised or lowered to immerse the mold at varying depths.

Regulates Mold Temperature

Speed of movement of the mold through the cooling bath and the temperature of the water both regulate the mold temperature. After the mold passes through the bath, a small projection on the side of the mold opens the valve to the smoking burner *H* in Fig. 1. This burner uses gas which is incompletely consumed. This produces a heavy, yellow flame containing many unconsumed carbon particles which are deposited on the mold faces that pass on either side of the burner. Excess soot or carbon is removed by a vertically revolving brush.

After brushing, the eccentric arm action closes the mold and a roller and lever action operates the toggle device which clamps the two halves of the mold together. The roller and lever system and the toggle device may be observed at *J* at the upper right in Fig. 1. As may be noted, the clamping device has the appearance of a large open-end wrench. The jaws have a slight taper and when the mold is closed, the device is forced vertically down over two roller pins, one on each half of the mold. The taper of the jaws forces the two parts of the mold tightly together. Then the mold is ready to be dipped into the molten metal and to begin another cycle.

Figs. 2, 3, 4 and 5 show some of the castings which may be produced by the machine. Fig. 2 is a tube of white metal 1-inch in diameter, 4 inches long, and the walls are 1/100-inch thick. The seam made by the mold may be noticed at the top of the tube. Figs. 4 and 5 are lead, storage-battery grids. These grids are about 5 x 5½ inches long and as may be noted in the illustrations, contain numerous vertical and horizontal bars. These bars taper from front to back from 1/64 to ⅛-inch, and it will be observed that these bars are run full and sharply cut. Fig. 3

(*Concluded on Page* 753)

Profits Are Uneven in General Manufacturing Industries

By John W. Hill

IT HAS become the fashion to speak of the present period of business as one of profitless prosperity. This is not a strictly accurate description. Profits actually are not absent. In the aggregate the total for industry is relatively large. What is true, however, is that profits are unevenly distributed.

This fundamental fact is brought out with great force by a compilation of earnings of 19 important industrial companies made by IRON TRADE REVIEW and shown in the table on the opposite page. The companies, chiefly, are consumers of iron and steel in the manufacture of the products they place upon the market.

In this connection it is interesting to note that the rate of return on capitalization of the miscellaneous users of steel is far higher than the average rate of return upon capitalization of steel companies. This comparison will be shown for 1927 in next week's issue, when IRON TRADE REVIEW will present its annual tabulation of earnings of iron and steel companies.

The 19 companies included in the present compilation had an aggregate capitalization at the beginning of 1927 of $1,881,721,678. They earned the combined sum of $352,897,374 or 18.76 per cent upon their capital. This compared with an aggregate capital of $1,640,118,735 and earnings of $299,350,175 or 18.25 per cent upon capital in 1926.

At first glance these figures seem to be at variance with the generally acknowledged fact of an industrial slump in 1927. Why is it that in the face of declining business last year accompanied by lower prices and bitter competition in many lines, that earnings of these representative industrial companies showed a clear gain of 17 per cent over 1926?

The answer is not difficult to discover. It is found in the figures of the General Motors Corp. At the start of 1926 General Motors had a capitalization of $488,978,240. During that year it earned, before dividends and bond interest, the sum of $176,698,743, or 36.12 per cent upon its capitalization. At the beginning of 1927 General Motors had a capital of $1,269,519,673 upon which it earned $239,264,725, or 37.60 per cent upon capitalization. The gain in net earnings for this giant motor company in 1927 over 1926 was 35 per cent.

This remarkable increase was at least partly due to the withdrawal from the market of General Motors' most formidable competitor in the small car field, the Ford Motor Co. That development, arising from Ford's necessity to create a new model, enabled General Motors greatly to increase its sales in 1927, despite general conditions that were far from being good. Another factor entering into the showing of General Motors is its great size and vast resources, which give it many advantages in present day competition.

No Counterpart Seen

The amazing improvement in General Motors earnings has no counterpart in any other company included in the compilation. In fact excluding General Motors, the picture takes on a different color. For the 18 companies, without the great motor car manufacturer, the combined capital was $1,151,140,000 and the earnings $122,652,000 or 16.53 per cent on capital in 1926. Last year with capitalization fully 8 per cent greater or $1,245,043,000, earnings were 7 per cent less than in 1926, or $113,633,000. This was only 10.96 per cent upon capitalization earned by companies in the list, other than General Motors.

Even among the companies, other than General Motors, earnings upon capitalization as shown in the compilation are far from revealing equality. Among the industries represented in the list of 19 companies are automobiles, car building, locomotive building, machine tool, building supplies, shipbuilding, farm implements, foundry, and automotive accessories.

Based upon the figures as developed by the computation, it is seen that the least favorable showing of earnings was made by railroad car and locomotive builders and machine tool companies. Relatively the most favorable showing was made by companies engaged in the automotive field or the building industries.

One of the companies to make the most impressive exhibit of earnings is that of Timken Roller Bearing Co. With a total capital of $25,064,780 at the beginning of 1926, this company earned $9,854,310 before bond interests and dividends in 1926, or 39.30 per cent upon its aggregate capital. In 1927 with a capital of $28,109,901 the company earned $10,221,537 before bond interest and dividends of 36.30 per cent upon its capital.

American Radiator also made an interesting showing, indicating that the building industry continues at a high level, although not at its peak in 1926. This company earned $12,216,688 before bond interest and dividends in 1927 or 17.60 per cent upon its capital of $69,444,644. This compared with earnings of $12,842,633 before bond interest and dividends earned in 1926 or 20.43 per cent upon its capital of $62,775,255 that year.

The International Harvester Co. reported earnings of $25,066,595 before bond interest and dividends or 10.34 per cent upon its capital of $242,488,062 in 1927. This compared with a net earned on capital of 10.52 per cent in the preceding year, and it reflected the basic improvement which has appeared in the agricultural section, and which persisted during 1927 despite recessions in general manufacturing industry during last year.

Among the few companies to make reports of gains in earnings in 1926 was that of the American Shipbuilding Co., a fact which gives evidence of improvement in the long depressed shipbuilding industry. During 1927 this company earned $1,747,374 before bond interest and dividends or 8.19 upon its capital of $21,337,167 compared with $1,150,122 earned in the preceding year or 5.34 per cent on capital.

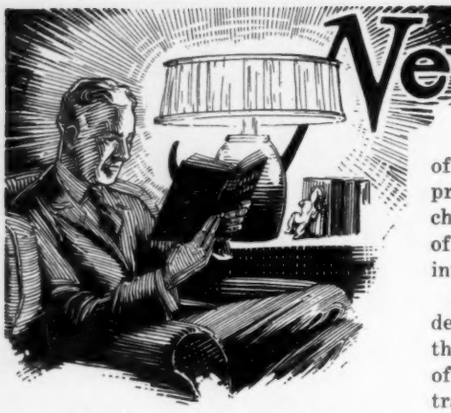
Transue & Williams Steel Forgings Co. also showed an increase, turning a deficit of $177,758 in 1926 into a net profit of $13,864 in 1927. The Worthington Pump & Machinery Co. increased its earnings from $365,663 to $600,334 in 1927.

Miscellaneous Industrial Companies

Large Consumers of Steel

		BALANCE SHEET VALUE—As of the beginning of the year (Value at end of previous year, equivalent to value at beginning of current year)					Sales	Total Income (includes income from all sources)	Net Income Before Bond Interest and Div.	Percent Earned on Total Capital Net Income Capital	Operating Income	Ratio of Sales to Net Inc.
		Funded Debt	Common	Preferred	Surplus	Total Capital						
American Can	1926	.....	$41,233,300	$41,233,300	$53,345,092	$135,811,692	(a)	$18,436,382	$13,736,382	10.12%	$18,436,382	....
(Years end. Dec. 31)	1927	.....	61,849,950	41,233,300	38,630,497	141,713,747	(a)	17,455,199	13,055,199	9.22	17,455,199	....
American Car & Fdy. Co.	1926	.....	30,000,000	30,000,000	37,742,570	97,742,570	(a)	(b) 9,274,572	6,102,898	6.24 (b)	9,274,572	....
(Yrs. end. Dec. 31)	1927	.....	30,000,000	30,000,000	41,245,296	101,245,296	(a)	(b) 7,837,528	4,593,378	4.54 (b)	7,837,528	....
American Loco.	1926	(c) 432,000	25,000,000	25,000,000	16,396,386	66,828,386	(a)	(d) 10,352,193	8,015,939	11.99 (b)	8,015,939	....
(Yrs. end. Dec. 31)	1927	(c) 432,000	38,500,000	38,389,600 (i)	30,678,739 (i)	108,000,339	(a)	(d) 8,512,324	6,391,277	5.92 (b)	6,391,277	....
Amer. Steel Fdy.	1926	(c) 289,141	30,000,000	8,881,300	11,641,313	50,811,754	(a)	5,595,711	4,675,796	9.20 (b)	5,173,448	....
(Yrs. end. Dec. 31)	1927	(c) 305,349	30,000,000	8,713,000	12,990,889	52,009,238	(a)	5,037,047	4,076,094	7.83 (b)	4,483,655	....
Baldwin Loco.	1926	10,000,000	20,000,000	20,000,000	15,763,833	65,763,833	47,891,669	7,668,914	7,060,399	10.73	3,811,253	6.78 : 1
(Yrs. end. Dec. 31)	1927	10,000,000	20,000,000	20,000,000	18,847,740	68,847,740	32,901,143	4,384,662	3,121,414	4.54	2,047,347	10.50 : 1
Blaw-Knox Co.	1926	.....	6,217,625	967,600	1,163,067	8,348,292	(a)	3,697,420	1,612,450	1.93	1,974,494	....
(Yrs. end. Dec. 31)	1927	.....	6,217,625	783,400	1,809,875	8,810,900	8,494,784	3,578,514	1,352,026	1.53	1,510,995	6.28 : 1
General Motors (Yrs. end. Dec. 31)	1926	(c) 1,961,818	258,079,950	7% - 104,619,200 6% - 2,175,700 deb.6%-3,121,100	119,020,473	488,978,240	1,058,153,338	222,881,501	(e) 176,698,743	(e)36.12	202,533,682	6.04 : 1
	1927	(c) 2,420,685	435,000,000	7% - 105,333,200 6% - 1,795,900 deb.6%-2,786,900	89,341,318	636,678,004	1,269,519,673	301,964,701	(e) 239,264,725	(e)37.60	273,783,484	5.30 : 1
Inter. Harvester	1926	4,092,500	99,876,772	62,678,400	64,934,939	231,582,611	(a)	(b)34,348,913	(b) 24,364,771	10.52	(b) 34,348,913	....
(Yrs. end. Dec. 31)	1927	.....	99,876,772	65,568,400	77,042,890	242,488,062	(a)	(b)36,863,501	(b) 25,066,595	10.34	(b) 36,863,501	....
National Acme	1926	3,500,000	5,000,000	.....	3,234,114	11,734,114	7,635,448	511,123	443,607	3.78	477,045	17.21 : 1
(Yrs. end. Dec. 31)	1927	2,840,000	5,000,000	.....	3,375,511	11,215,511	6,534,174	441,023	366,197	3.27	407,096	17.82 : 1
United Engineering	1926	.....	6,935,300	1,770,300	2,451,804	11,157,404	10,185,605	2,254,641	1,638,281	14.67	2,028,548	6.22 : 1
(Yrs. end. Dec. 31)	1927	.....	6,935,300	1,770,300	3,001,970	11,707,570	10,395,700	2,249,121	1,642,391	14.02	1,943,830	6.33 : 1
Westinghouse Elec. & Mfg.	1926	36,242,000	114,504,450	3,998,700	51,199,325	205,944,475	166,006,801	16,590,225	16,590,225	8.06	(b) 14,294,862	10.00 : 1
(Yrs. end. Mar. 31)	1927	36,115,000	114,504,450	3,998,700	51,715,396	206,333,546	185,543,087	18,364,616	18,364,616	8.90	(b) 15,779,002	10.10 : 1
Mack Trucks	1926	(c) 12,728 (f)	19,619,791	..... (h)	38,015,016 (h)	57,647,535 (h)	69,032,203	10,237,153	8,852,453	15.35	10,237,153	7.80 : 1
(Yrs. end. Dec. 31)	1927	(g) 2,810,010 (f)	20,164,225	.....	52,070,331	75,054,566	55,270,295	6,664,307	5,844,307	7.79	6,664,307	9.49 : 1
Transue Williams	1926	.....	550,000	.....	2,860,098	3,410,098	3,649,744	(k) 172,501	(k) 177,758	(k) 5.21	(k) 231,134	....
(Yrs. end. Dec. 31)	1927	.....	550,000	.....	2,582,340	3,132,340	2,436,939	46,684	13,864	0.44	(k) 13,611	....
Worthington Pump & Mchy.	1926	200,000 (f)	20,951,000	.....	4,331,100	25,482,100 (n)	17,141,457	415,663	365,663	1.44	167,978	46.90 : 1
(Yrs. end. Dec. 31)	1927	..... (f)	20,951,000	.....	3,938,664	24,889,664 (n)	16,520,838	600,344	600,344	2.41	435,301	27.50 : 1
Amer. Radiator	1926	(c) 3,831,400	31,064,025	3,000,000	24,879,830	62,775,255	(a)	(d)15,208,322	(d) 12,842,633	(d)20.43	(d-b)14,427,611	....
(Yrs. end. Dec. 31)	1927	(c) 3,782,500	31,064,025	3,000,000	31,598,119	69,444,644	76,010,078	(d)14,206,240	(d) 12,216,688	(d)17.60	14,695,538	6.22 : 1
Amer. Ship Bldg.	1926	.....	14,714,400	785,600	6,033,231	21,533,211	(a)	2,521,349	1,150,122	5.34	2,128,834	....
(Yrs. end. June 30)	1927	.....	14,714,400	785,600	5,837,167	21,337,167	(a)	3,440,694	1,747,374	8.19	3,024,475	....
Midland Steel Products	1926	201,600	• 5,000	9,554,300	2,982,183	12,743,083	(a)	2,946,814	1,748,611	13.72	2,764,292	....
(Yrs. end. Dec. 31)	1927	.....	5,000	9,693,000	3,360,302	13,058,302	(a)	2,848,343	1,776,875	13.60	2,603,836	....
Allis-Chalmers Mfg.	1926	.....	26,000,000	16,500,000	14,259,302	56,759,302	30,682,543	4,216,892	3,596,892	6.34	3,496,417	8.53 : 1
(Yrs. end. Dec. 31)	1927	.....	26,000,000	16,500,000	15,155,141	57,655,141	33,352,252	4,187,554	3,182,473	5.51	3,469,148	10.47 : 1
Timken Roller Bearing	1926	.....	6,000,000	.....	19,064,780	25,064,780	(a)	12,229,221	9,854,310	39.30	11,561,054	....
(Yrs. end. Dec. 31)	1927	.....	6,000,000	.....	22,109,901	28,109,901	(a)	12,506,219	10,221,537	36.30	11,784,022	....
Total 19 Companies	1926	.....	.....	.....	.....	1,640,118,735	.....	379,214,508	299,350,175	18.25	.....	....
	1927	.....	.....	.....	.....	1,881,721,678	.....	451,188,621	352,897,374	18.76	.....	....
18 Companies excluding	1926	.....	.....	.....	.....	1,151,140,000	.....	.....	122,652,000	16.53	.....	....
General Motors	1927	.....	.....	.....	.....	1,245,043,000	.....	.....	113,633,000	10.96	.....	....

(a) Unavailable
(b) After taxes
(c) Minority interest
(d) After expenses
(e) Excludes equities in undivided profits of subsidiary companies
(f) Includes preferred
(g) Includes minority interest
(h) Excludes subsidiaries
(i) Includes surplus acquired thru purchase of Railway Steel Spring
(k) Deficit
(n) Billings to customers



New Books Worth Reading

Wholesaler an Essential Medium

Wholesaling, by Theodore N. Beckman; cloth; 6 x 8½ inches; published by the Ronald Press Co., New York, and supplied by IRON TRADE REVIEW for $6.00 postpaid, and in Europe by Penton Publishing Co. Ltd., Caxton House, London, for 30 shillings net.

Much has been written on the subject of retailing but the literature on wholesaling is not extensive. In this treatise the author first establishes the essential functions that the wholesaler plays in the processes of distribution, whether these are performed by the jobber himself, or by the manufacturer or retailer. The trend toward circumventing the wholesaler by manufacturers attempting to reach the consumer direct is discussed by the author. Three reasons presented why manufacturers are dissatisfied with jobbers' services are: Lack of intensive cultivation; indifference or even hostility to a manufacturer's advertising program, and the pushing of private brands at the expense of competing brands of manufacturers.

After establishing the wholesaler as a unit, the author discusses internal management problems, dealing with prices, credits, budgetary control, in management, buying policies and sources of supply, stock turnover and stock control, advertising and dealer helps, selection and training of salesmen, sales planning and control, packing, shipping, billing, traffic management, etc.

The book is profusely illustrated with forms and tables, including order, inventory, stock record, blanks, and classifications of various kinds.

* * *

Retail Merchandising Discussed

Retail Merchandising, Planning and Control, by James L. Fri; 6 x 9 inches; 363 pages; published by Prentice-Hall Inc., New York, and supplied by IRON TRADE REVIEW for $4.00 postpaid, and in Europe by Penton Publishing Co. Ltd., Caxton House, London, for 20 shillings net.

The increasing importance of merchandising, especially from the standpoint of cost involved, makes this book of interest despite its previous two printings. In discussing retail merchandising, the fundamental problems of organization, expenses and profits, inventory, etc., are considered.

Much of the treatise on retailing deals with the internal organization of the retail houses, such as subdivision of departments, selection of salesmen, training, commissions, personnel, etc. On the broader subject of retail merchandising are covered advertising and merchandising in general. Under advertising is treated the problems of appropriation, measuring return, institutional advertising, direct sales, direct mail, and the detailed methods of handling such campaigns. Price policies, and the effects of underselling are among the items discussed under the heading of merchandising policies.

Chart illustrating many of the points stressed are included in the book.

Manual of Canadian Trade

Canadian Trade Index, fourth edition, by Canadian Manufacturers' association, Toronto; cloth, 884 pages, 6½ x 10 inches; supplied by IRON TRADE REVIEW at $6, postpaid, and in Europe by Penton Publishing Co. Ltd., Caxton House, London, for 30s, net.

Following the general lines of previous editions, this issue contains also a new section provided by the department of trade and commerce of the dominion government. This has a wealth of statistical matter, freight rates, trade term definitions and customs of export financing.

The main object of the book is to provide buyers of Canadian goods a dependable list of Canadian products and the names of manufacturers making them. Members and non-members of the association are listed without regard to affiliation. Careful arrangement of the various lists makes it an easy matter to refer to whatever information is sought.

* * *

Peering Into Metal Structure

Principles of Metallography, second edition, by Robert S. Williams and Victor O. Homberg; cloth, 259 pages, 5½ x 8 inches; published by McGraw-Hill Book Co. Inc., New York, and supplied by IRON TRADE REVIEW for $3 postpaid, and in Europe by Penton Publishing Co. Ltd., Caxton House, London, for 15s, net.

As in the first edition, which appeared in 1919, the purpose of this volume is to give the general reader the fundamentals of metallography and to serve as an introductory text for those who are to specialize in the field of alloys.

Advances in the science since the first edition and constantly increasing applications of the art have made extensive revision desirable. The photomicrographs of the first edition have been almost entirely replaced by newer photographs, in keeping with the present state of the science. A new chapter on the increasingly important subject of the *mac*roscopic examination of metals, has been added to the text.

In the appendices is much of value: A suggested outline of a brief laboratory course in metallography; a list of books and journals readily available, for further study; the common industrial alloys; etching solutions for *mac*roscopic examination; etching solutions for microscopic examination; method for identification of nonmetallic inclusions in iron and steel; etching solutions for nonferrous metals. Several tables in common use are also included.

The volume is a number in the international chemical series. The authors are professor and assistant professor of metallography in the Massachusetts Institute of Technology.

* * *

Essentials of Coating Metals

Protective Metallic Coatings, by Henry S. Rawson, 277 pages, cloth, 6 x 9 inches, published by the Chemical Catalog Co. Inc., New York, and supplied by IRON TRADE REVIEW, Cleveland, for $5.50. In London by the Penton Publishing Co. Ltd., 416-17 Caxton House, Westminster, for 27s 6d.

Corrosion of metals causes an enormous loss each year, and to prevent this waste many different types of metallic coatings are used. While the author does not pretend to make this book serve as a shop manual on coating processes, he does give the essentials of the various methods. Also author includes a discussion of the characteristics and properties of the various metallic coatings which determine the usefulness of the coatings and their limitations. The first section of the book is devoted to a discussion of the principles of the methods generally employed and the second section describes the methods of producing commercial coatings. The last chapter in the book is devoted to the different methods of testing the coatings and this is followed by a bibliography arranged according to the coating metal.

Continuous Mill Will Supply Bars for Tin Plate Division

Light Weight Tin Bars Delivered by the Finishing Rolls at High Speed Are Made to Overlap Before Reaching the Bar Piler—Three Hot Beds Are Provided

By F. B. Pletcher

BUILDING of a thoroughly modern 21-inch 2-high continuous sheet bar and skelp mill was a logical step taken by the Youngstown Sheet & Tube Co. in rounding out the units of its Indiana Harbor works in the Chicago district. The new mill has been under successful operation for some months. It is a preparatory unit for the new tin mills completed at the Indiana Harbor plant more than a year ago.

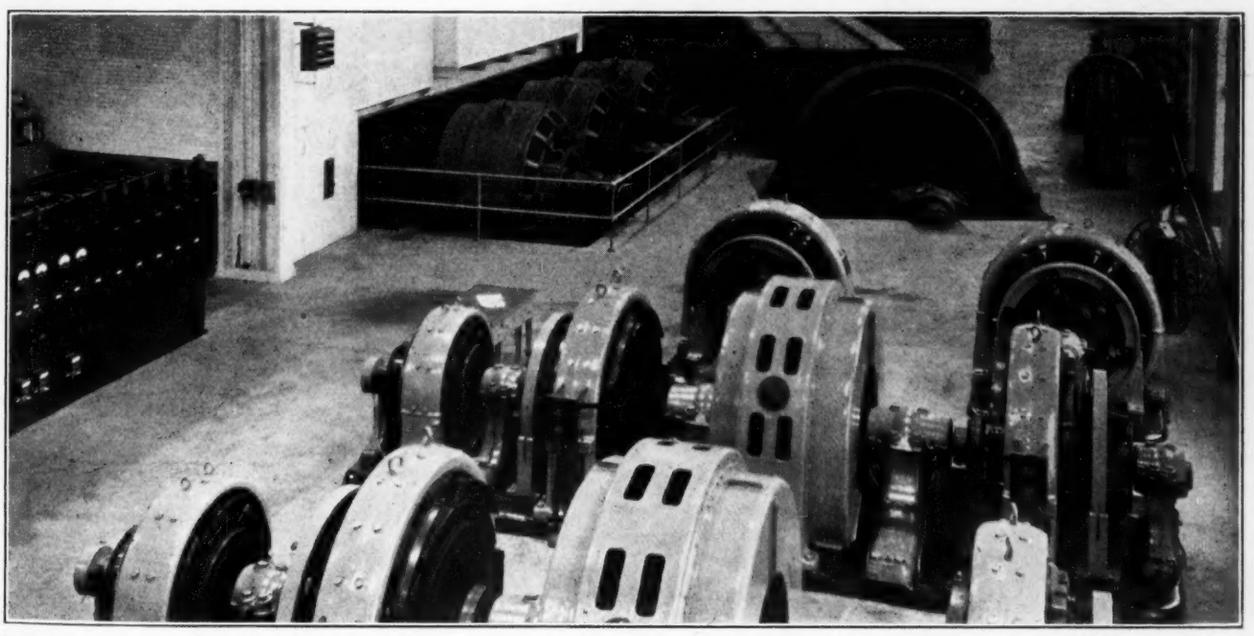
Inasmuch as the 21-inch mill up to this time has not been crowded for maximum production, the actual output possibilities have not been reached. Satisfactory production results are being obtained, however. In the building of this plant unit, the best in modern rolling practice was obtained with a minimum outlay and the best use of facilities already at hand. The plant at Indiana Harbor thus is self-contained as to the tin bar production for service to the tin mills, which are capable of turning out 115,000 to 120,000 net tons of tin plate yearly.

The regulation sheet bars of 8-inch widths are produced and all ranges of material can be handled by the mill for rolling. The mill is designed to roll skelp 6¼ to 16¾ inches wide. The parallel 28-inch billet mill rolls square billets and slab billets used by the 10-inch skelp mill, which is in parallel line and just to the east of the 21 and 28-inch mills. The 28-inch mill is a 2-high reversing mill and turns out material 1¾ to 2½-inch square billets and slab billets up to 9½ inches wide.

The 21-inch mill was laid out parallel to the 28-inch billet mill, the structure housing the two being 85 feet wide. A single row of columns in the building housing the 28-inch mill facilitated the widening of the building to 85 feet to place both mills under one roof.

In developing the continuous mill layout, a slab transfer with approach tables and a 1000-ton motor driven up-cut shear were installed at the end of the blooming mill and to one side of the old blooming mill shear; the new shear handling the slabs for the 30-inch universal mill and the material for the 21-inch mill passing through the old shear. The slabs automatically are kicked off on the slab pilers and weighed. A chain transfer with tables moves the material from the blooming mill to the 21-inch mill. To speed up the 28-inch mill, electric manipulators were installed. Further speed will be obtained by replacing a hydraulic screwdown with a modern electric screwdown. All the tables and rollers are equipped with standard roller bearings on the off-drive side and bronze bushings on the drive side. Oil trough splash lubricating system is used. At the head of the 21-inch mill is the up-and-down cut shear for cropping bad ends and for emergency work.

The new 21-inch mill is comprised of a train of ten horizontal 2-high stands and three vertical edging stands in tandem. The first three are roughing stands, with 24-inch rolls, the next four are the intermediate, and the three stands completing the train are the finishers. The 18-inch edg-



GENERAL VIEW OF THE MOTOR ROOM SHOWING THE MOTOR-GENERATOR SETS IN THE FOREGROUND AND THE MOTOR DRIVES IN THE REAR

GENERAL VIEW OF THE 21-INCH MILL AT THE RIGHT AND THE 28-INCH MILL AT THE LEFT LOOKING TOWARD THE STARTING END

ing stand is between stands Nos. 3 and 4, or between the roughing and intermediate rolls. One of the two 16-inch edging mills is between stands Nos. 5 and 6 of the intermediate rolls, while the third of the edgers, also 16-inch, is between stands Nos. 7 and 8 of the finishing train. The first and the last edging rolls have independent drives.

The group of three roughing stands is driven by a 3600-horsepower adjustable-speed, alternating-current motor through a 5 to 1 gear reducer and three sets of bevel gears. The reduction gears are of the herringbone type with 3.14 pitch and 36-inch face. The four intermediate and the first of the pair of 16-inch edging stands similarly are driven by an adjustable-speed, alternating-current motor rated at 7500 horsepower. Each of the three finishing stands are direct driven separately by a 2000-horsepower direct-current, adjustable-speed motor.

After the material leaves the finishing rolls of the 21-inch mill, it follows a short section of the roller runout table and arrives at the steam flying shear for cutting sheet bar and the larger sections. Farther along in transit is the motor-driven rotary shear for cutting skelp and other material up to ⅝ x 15 inches. Each shear is equipped with its own automatic measuring device, which permits rapid cutting of the material to desired lengths.

A runout table carries the sheet bars and skelp to a traveling bar piler mounted on a double steel rail. An overhead 15-ton crane takes the load from the bar piler to the cooling beds. The table has shingling and pinch rolls. The shingling rolls, which are only used on lighter sections delivered at high speed cause the sheet bars to overlap before they reach the bar piler, where they are piled by the functioning of the pinch rolls.

The runout table also is equipped with spray boxes for quenching the rolled material. The quenching water is furnished by two motor-driven pumps and the water is taken from a tank beneath the table, this tank having capacity for 200,000 gallons of water. The sprayed water after falling on the rolled material, returns into the tank, whence it goes through the quenching cycle again.

The delivery yard of the mill is served by three 15-ton cranes one in the first span and two in the second with the parallel runways, each 120-foot span, covering the runout table and the cooling beds of the 21 and 28-inch mills. The cooling beds serve as the billet and sheet bar yards and are roofed over, the billet yard being convenient to the 10-inch skelp mill.

Transfer Methods Differ

The cooling beds consist of three beds of structural steel, each 30 x 60 feet. The tin bars after cooling are loaded upon cars for shipment to the tin mills, an interplant movement. The skelp is loaded from the cooling beds to transfer cars, which serve the pipe mills. Formerly a rope-driven transfer car handled the billets from the cooling bed to the 10-inch skelp mill. It was found possible to replace the transfer car by a runout table, thereby making direct connection between the cooling bed of the 28-inch billet mill and the furnace of the 10-inch skelp mill just ahead. Thus considerable crane handling is eliminated, the table running through to the furnace and hot steel can be changed to the 10-inch mill furnace.

In the mill building a large scale pit has been installed. This is of concrete construction lined with steel rails. The scale pit serves both the 21 and 28-inch mills, the tables of which are parallel and 40 feet from center to center. Between the seven last stands in the 21-inch mill are bar looper tables operated by hydraulic cylinders.

The motor room, 47 x 308 feet, contains a 50-ton crane serving the bevel gear and reduction gear drives and the motors. The motor room, of brick and concrete construction, has a high-low bank roof, which is thoroughly insulated to guard against condensation. The roof is of cement tile and a layer each of insulating cork and composition roofing. The motor room is equipped with cooling fans, with air filters at the fan rooms.

The main roll drives for the 21-inch mill present an interesting installation, the speed regulation being essentially a modified Kramer drive through feed-back from the alternating-current motors. This type of drive and the application of synchronous motor-generators is considered decidedly advantageous, as far as the power factor is concerned. The power factor of the plant has been improved to an average of 94 per cent.

The 2200-volt, adjustable-speed, alternating-current motor driving the roughing rolls, with 1940 to 3600 horsepower with 50 degree Cent. rise has a speed range of 156 to 290 revolutions per minute, 3 phase, 60 cycles. The 2200-volt, adjustable-speed, alternating-current motor driving the intermediate stands, with a rated horsepower of 4040 to 7500, with 50 degree Cent. rise has a speed range of 134 to 250 revolutions per minute. A 250-volt, 250-horsepower, direct-current motor, with a speed range of 175 to 350 revolutions per minute drives the edging rolls in front of finishing stands.

Stands Nos. 8, 9 and 10 of the finishing mill are individually driven by three 2000-horsepower, 50 degree Cent. rise, 600-volt, direct-current motors with a speed range of 85 to 165 revolutions per minute. The

power for these is obtained from one end of three synchronous motor-generator sets, each consisting of one 4400-kilovolt ampere, 90 per cent power factor, 2200-volt, 600 revolutions per minute, 3-phase, 60-cycle synchronous motor, two 1700-kilowatt, 600-volt generators and one 250-kilowatt, 250-volt exciter. This system of control is Ward-Leonard and permits starting, stopping and reversing separately each of the finishing mills.

The 3600-horsepower motor is of the slip-ring induction type, with its stator winding connected to the power supply, and with its secondary windings connected through slip-rings to the alternating-current side of a synchronous converter, rated 1700 kilowatts, 500 revolutions per minute, 600-volt, 6-phase, 25 cycles. This unit converts the slip energy of variable potential and frequency into direct-current power, which is conducted to the direct-current end of one of the synchronous motor-generator sets, the other direct current end being used to drive one of the 2000-horsepower finishing mill motors. By varying the field of this direct-current machine, the voltage introduced into the secondary of the main motor can be changed thereby controlling its speed. Similarly, the speed of the 7500 horsepower is controlled, except that two synchronous converters, operating in parallel, and two direct-current machines are used.

The 18-inch edging rolls are driven by a 200-horsepower, 300 to 900 revolutions per minute, 230-volt motor. The direct-current generators all are interchangeable and all three rotaries are of duplicate size and interchangeable. Operation is from the main pulpit and from the mill pulpits. The control is accomplished through standard master switches with coarse and fine adjustable rheostats for speed regulation. All controls are handled by pulpit operator. One operator takes care of the whole mill on the main drive.

The electrical equipment including the drives, control, bench board and switchboard, was furnished by the General Electric Co., Schenectady, N. Y. The mill and approach tables and equipment with gear reduction were furnished by the Morgan Construction Co., Worcester, Mass. Slab pilers, runout tables and transfer tables were manufactured by the Mackintosh-Hemphill Co., Pittsburgh, and the motor driven up-cut shear and electric manipulators by the Mesta Machine Co., Pittsburgh. Cranes were furnished by the Morgan Engineering Co., Alliance, O. The pumps for the quenching tanks were furnished by the Ingersoll-Rand Co., New York. Air filters are used and the fans were manufactured by the B. F. Sturtevant Co., Boston. The lubrication of the mill is forced feed, one unit being on the roughing mills. The lubrication system was furnished by S. F. Bowser & Co., Fort Wayne, Ind.

Offers Ten Fellowships for Research Work

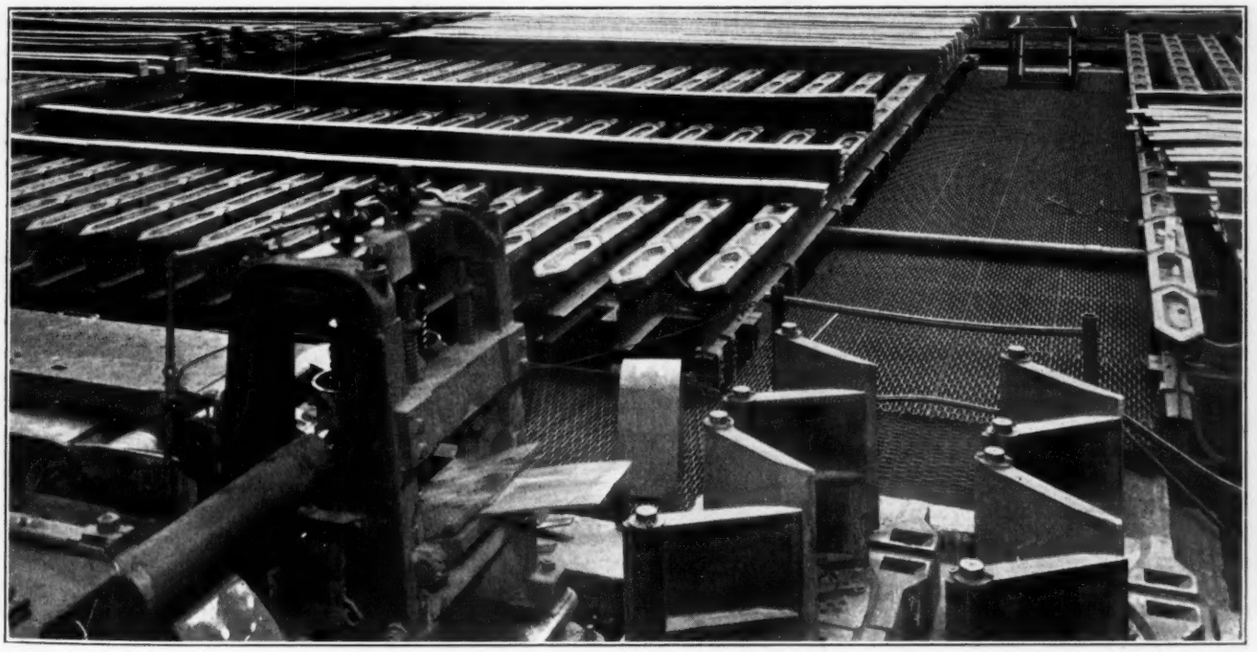
Continuing its program of scientific research in co-operation with the United States bureau of mines and two advisory boards representing the mining and metallurgical industries, Carnegie Institute of Technology, Pittsburgh, will award ten fellowships in mining and metallurgical research during the coming year. Fellowships are open to the graduates of colleges, universities and technical schools who are qualified to undertake research investigations.

Several of the fellowships will be financed by companies and organizations representing the mining and metallurgical industries. Appointments to the ten new fellowships will be made during the spring and early summer months, with the preliminary investigations of the new program to begin in August. Subjects for research by the fellowships appointed for 1928-29 will be selected in the fields of "origin and constitution of coal," "coal mining," "utilization of coal," "mine safety," and "physical chemistry of steel making."

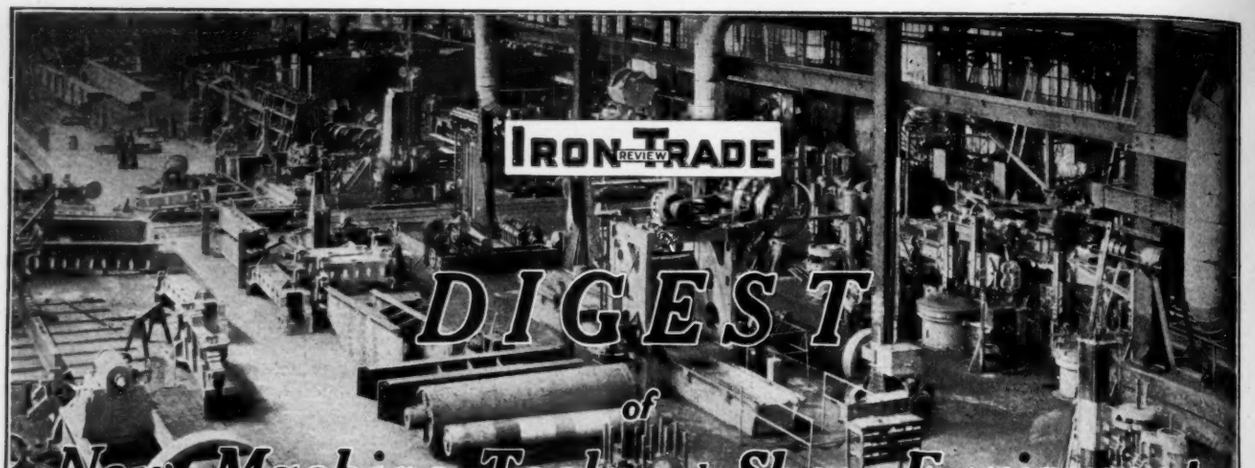
Announces Meeting

The Foundry Equipment Manufacturers association has announced that its spring meeting will be conducted at French Lick Springs hotel, French Lick, Ind., April 18-19. H. Cole Estep, 1213 West Third street, Cleveland, is secretary-treasurer of the organization.

The government of India has accepted the recommendations of the tariff board for imposition of revised import duties on bolts and nuts and wire and wire nails, according to a cablegram to the department of commerce from Trade Commissioner Charles B. Spofford, Calcutta.



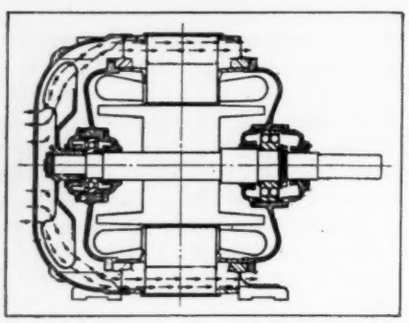
ONE OF THREE COOLING BEDS FOR TIN BARS IS SHOWN IN THE BACKGROUND. IN THE FOREGROUND IS THE TRAVELING BAR PILER



Motor Given Protection by Air Jacket

No. 77

Wagner Electric Corp., St. Louis, has designed an air-jacketed electric motor for service where dust, fumes and moisture are present in sufficient quantities to make protection necessary. As shown in the accompanying illustration, the motor is surrounded by a jacket at both ends with fan blades on a shaft extension between the sealed motor and its outer jacket. The only clearance between rotating and stationary parts is the bearing housing and here no impurities can get past the grease packing. The motors are new in external construction only, no changes having been made in the electrical principles. The frame housing, the motor proper and all bearings are substantially air tight. The end shield is made of cast iron, rib reinforced and has a substantial grating which protects the fan and provides an opening for incoming air. The center shield is made of heavy sheet steel held in place by slot head bolts. Single-phase repulsion-induction motors may be had in sizes from 1 to 20 horsepower and polyphase squirrel-cage motors in sizes from 2 to 30 horsepower. These motors are designed for a temperature rise not to exceed 50 degrees Cent.

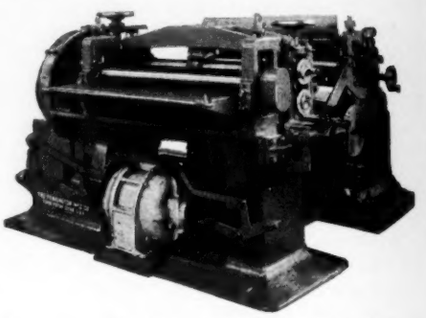


No. 77—Electric motor with air jacket

Unit Combines a Slitter and 3-Roll Coiler

No. 78

Torrington Mfg. Co., Torrington, Conn., announces a recently-designed combination of a slitting machine with lawn-mower type scrap cutter and a 3-roll coiler, in which it is possible to take five cuts of copper ⅛-inch thick up to 42 inches trimmed



No. 78—Slitting machine and coiler

Iron Trade Review's Calendar of New Equipment

No.	Item	Builder	Comment	Date Described
57.	Thread miller	Smalley-General Co.	Performs heavy work without chatter	March 1
58.	Bus bar supports	Westinghouse Electric & Mfg. Co.	Modified hollow square type	March 1
59.	Geared head lathe	Cincinnati Lathe & Tool Co.	Motor mounted in cabinet leg	March 1
60.	Spiral weld iron pipe	Naylor Spiral Pipe Co.	Grooved ends for victaulic couplings	March 1
61.	Limit switch	General Electric Co.	For magnetic control	March 1
62.	Straightening machine	Sutton Engineering Co.	Accurate straightening in single pass	March 1
63.	Radial rolling machine	Aetna-Standard Engineering Co.	Specially designed for disk sections	March 1
64.	Welding electrodes	Fusion Welding Corp.	Mild steel; for arc welding	March 1
65.	Valve face grinder	Landis Tool Co.	Semiautomatic and hydraulic	March 1
66.	Induction motor starter	Lincoln Electric Co.	Adjustable with automatic features	March 1
67.	Axle lathe	Consolidated Machine Corp.	Heavy-duty, center drive, oil-geared	March 1
68.	Gas welding outfits	Oxweld Acetylene Co.	For sheet metal and automobile repair	March 1
69.	Air grinder and sander	Independent Pneumatic Tool Co.	New design; balanced, vibrationless	March 8
70.	Knife blade grinder	Samuel C. Rogers & Co.	Automatic, sectional wheel	March 8
71.	Belt conveyor pulley	Jeffrey Mfg. Co.	Plain, bushed and roller bearing	March 8
72.	Dragline bucket	Harnischfeger Corp.	Electrically-welded, heavy-duty	March 8
73.	Angle-head drill	Stow Mfg. Co.	Attachment for flexible shaft equipment	March 15
74.	Chain hoist	Ford Chain Block Co.	Hand-operated; welded chain	March 15
75.	Electric hand saw	Wodack Electric Tool Corp.	Performs vertical and bevel sawing	March 15
76.	Lead hardening furnace	General Electric Co.	Pot-type, electrically heated	March 15
77.	Electric motor	Wagner Electric Corp.	Totally enclosed, air jacketed	March 22
78.	Slitting machine and coiler	Torrington Mfg. Co.	Slits and coils simultaneously	March 22
79.	Flexible-shaft unit	Stow Mfg. Co.	Direct, connected; overhead suspended	March 22
80.	Gasoline locomotive	H. K. Porter Co.	New design; new type drive	March 22

width, with facility for cutting up the scrap edges and coiling the slit strips, all in one operation. The equipment consists of a slitter of wide face, with a reinforcing bridge preventing springing of cutter arbors; a pair of driven feed rolls for entering metal in the slitter; a scrap cutter built integral with slitter, equipped with guides and operated by a flexible rope drive; and a separate 3-roll coiling unit, slidably mounted on rails and equipped with feed rolls which act as burring rolls for the slitter. The accompanying illustration shows the entering side of the slitter with guide table and controls. The combination unit is driven by a single motor with power transmitted through a friction clutch controlled by a double foot treadle.

Flexible Shaft Machine Is Suspended Type

No. 79

Stow Mfg. Co., Binghamton, N. Y., is placing on the market a direct-connected suspended unit which gives rotary motion at correct speeds from a 1-horsepower ball-bearing motor through a flexible shaft to grinding wheels, buffers, etc. The shaft is ball bearing and is furnished in a 6-foot length, although longer sections can be supplied. It can be attached to an angle head attachment or will give rotary motion direct to rotary files, sanding disks, abrasive wheels, buffing and polishing pads and various other attachments. The assembly is arranged for quick interchange of attachments, takes up no floor or bench room and can be suspended over the operation.

Gasoline Locomotive Has an Improved Drive

No. 80

H. K. Porter Co., Pittsburgh, has just brought out a gasoline industrial locomotive which is new in design and drive principle. The power plant, clutch and transmission are mounted on steel subframe and form a straight line drive to the reverse unit. This subframe acts as a torque arm pivoted on the rear axle and spring suspended at the front to the main frame. By an ingenious arrangement, the weight of the rear end of the subframe is carried on the main frame by a coil spring with the result that all the vital parts of the locomotive, namely, the engine, radiator, clutch transmission and reverse unit are mounted on a subframe which is spring suspended to a spring-suspended cross-equalized main frame. The main frames and bumpers are made of rolled steel slabs and are quite massive, as shown in the accompanying illustration. The running gear, including steel-tired driving wheels, side rods, driving boxes, shoes, wedges, springs, etc., are the same as used on a steam dinkey built by the company.

Applies Vacuum Principle in Making Castings

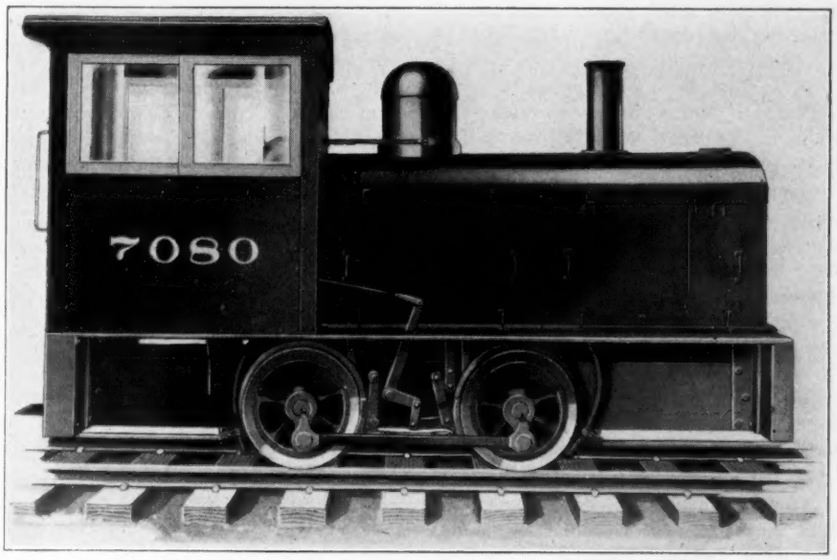
(*Continued from Page* 745)

illustrates the method of vacuum control. In making this casting, the vacuum was decreased considerably which caused the mold to run short.

The machine can produce 3000 battery grids of the type shown in the illustration in an hour if a single mold is used. With a double mold twice as many, or 6000 castings, can be produced in the same length of time. This, of course, refers to the machine having its 12 arms in operation, and a calculation will show that a casting either single or double is produced every 1-1/5 seconds.

The Vacuum Castings Co., Toledo, O., which manufactures the machines, is designing a smaller model which only has two arms, instead of 12. It is expected that it will be applicable to plants where smaller production is required. The company also is developing a machine which combines the vacuum process and a pressure to densen the casting. This machine fills the mold by the vacuum principle and then applies pressure of 200 tons. At present white metal bushings are being produced by this process and the fractured surface of one of the bushings examined showed a tough, solid, finely grained structure.

Although the present developments have been primarily with white metals, castings have been produced from other alloys such as aluminum. Later the company expects to carry on investigations with other nonferrous metals and alloys and gray iron, to determine the controlling and limiting factors. It is expected that when these characteristics have been determined, machines will be developed to employ the vacuum principle in producing castings from the various metals.



No. 80—Gasoline industrial locomotive featuring new type drive

February Cement Output Exceeds Year Ago

Production of portland cement in February totaled 8,785,000 barrels, compared with 9,766,000 barrels in January and 7,377,000 barrels last February, states the federal bureau of mines.

Shipments in February reached 6,559,000 barrels, compared with 6,540,000 barrels in January and 6,731,000 barrels in February, 1927.

At the end of February stocks aggregated 27,339,000 barrels, contrasted with 25,175,000 barrels at the end of January and 23,563,000 barrels at the close of February, 1927.

Production in February engaged 47.5 per cent of the industry's capacity.

"Thermal Expansion of Alloys of the 'Stainless Iron' type," is the title of scientific paper No. 570 just announced by the bureau of standards, Washington. The pamphlet was prepared by Peter Hidnert, associate physicist, and W. T. Sweeney, assistant scientific aid, both associated with the bureau. Copies of the pamphlet may be secured for 10 cents each by addressing superintendent of documents, government printing office.

Unique Metalworking Processes Mark Production of New Ford

(*Continued from Page* 741)

purities by the arc and has been heated from the inside out, speedily to correct welding heat.

"Now comes the forcing or squeezing of the two pieces together very quickly with no loss of time to remove from the heating element by an ingenious toggle action of enormous power much better and quicker than it could be hammered together. This squeezing also forces out any overheated metal that may be left, allowing the good clean virgin metal to make the contact.

"Thus welding, reduced to essentials, is just heat plus pressure."

Part by part, Model A reveals why it is a different kind of car. The gasoline tank, the top of which forms the cowl, is two pressed steel sections welded. The emergency brake lever, instead of being the conventional one-piece forging, is a stamping to which a small forging has been welded, affording equal strength with lightness. The battery bracket is a narrow section of strip, with a small section of sheet spot welded to form the base, bent at right angles to take two forgings which attach to the frame.

The fan blade, like the fan pulley, is two stampings welded, and in the final assembly welding is employed. The door frames, reduced to simple elements, are four pressed sections clamped into a fixture and welded by two successive applications of electricity. In the assembly of the muffler the baffles, the inner tube and the leads from the exhaust manifold and from the muffler proper over the rear axle all are welded.

In servicing as well as in production the stamping-forging-welding program is expected to effect great economies. So small a price may be set upon parts for replacement that it will be cheaper to replace them entirely with a new unit than to attempt to restore any part.

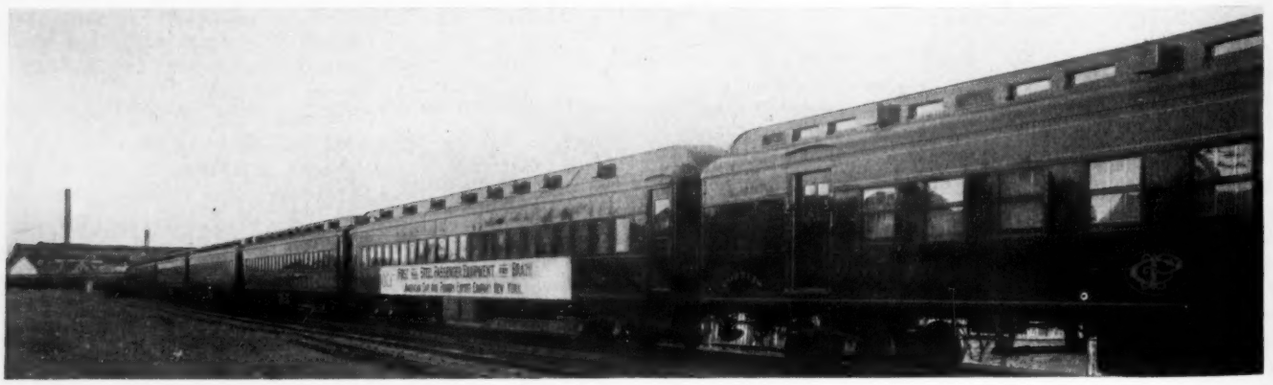
In shop practice, too, welding has been highly developed by the Ford organization. One of the by-products of the scrapping of warbuilt ships purchased from the shipping board—182 of the 199 taken over having been cut down—was a stock of pipe. Only two days being allotted for each ship, it was not found economical to disconnect the piping. Instead, it was cut by torch to conform with the speediest removal of side or deck sections. An accumulation of 8 to 12-foot lengths, in 14 diameters from ½-inch to 8 inches resulted.

Experimentation with flash welding developed a method by which more than 4,000,000 feet, or 800 miles, of this pipe has been welded into 20-foot lengths and put in stock for shop use at Fordson. Useless sections were first cut out or rejected, ends squared in a friction saw, the pipe classified as to size and straightened in punch presses equipped with special dies, and the portions to be gripped by the electrodes ground free of paint. Heavy fixtures were necessary to withstand the slipping of the pipe under the upset pressure of 2½ tons per square inch. A blast of compressed air, delivered in process, frees the inner flash while grinding removes the outer. The per-unit current cost has ranged from less than ½-cent on 1-inch pipe to 1½ cents on 8-inch pipe. The time cost on 1½-inch pipe is 8 seconds and on 8-inch sections under 1½ minutes.

Substantially all of the production welding equipment at Fordson has been devised or adapted by the Ford organization. For shop practice the same method has been followed. A hydraulic butt welder has been developed to weld "I" beam sections of the same size salvaged from the ship scrapping operation or resulting from structural work within the plant. Broken armature or generator-armature shafts are welded. Where bearing ends of shafts have been scored the damaged end is squared off and another piece welded on. Punch press frames have also been repaired by welding, at a cost one fifth that of replacement.

But to co-ordinate electrical and mechanical operations for the speedy upbuilding of such important units as the rear axle housing, gasoline tank and fan assembly, as will develop later, is accounted the real accomplishment of the Ford organization.

Ship First All-Steel Passenger Train for South America



TWENTY-TWO all-steel passenger cars were shipped on the steamer BELPAREIL, March 16, from Wilmington, Del., to Sao Paulo, Brazil, for the Paulista railroad. This is reported to be the first all-steel passenger equipment for South American railroads. The Paulista company placed an order in the fall of 1926 with the American Car & Foundry Export Co. for seven first-class coaches, six second-class coaches, three parlor cars, two dining cars, two mail cars and two baggage cars. The cars were built at Berwick, Pa. They conform in all essential construction to cars operating on first-class railroads in this country. The only variations are as to gage of track, type of couplers, buffers and brakes. The gage of track is 5 feet 3 inches. Vacuum brakes of European manufacture are provided and the foundation rigging is so arranged that automatic air brakes of similar type to that used by railroads in this country on passenger trains may be applied later.

Editorials

Ford Methods Now an Open Book
Ore Reserves Up Despite Shipments
Viewpoint Everything in Nonferrous Metals
Film Excels Words in Engineering
Fabricators Finding Volume Costly

Can Adapt, If Not Adopt, from Ford

WHETHER Henry Ford has genuinely served the American public by providing it cheap and dependable transportation may seem less certain after a Sunday on the highways than when considered in the abstract, but there can be no doubting the value of the contribution of the Ford engineering staff to all industry.

For in a very real sense the plants of the Ford Motor Co. are huge experimental laboratories. So insistent is the pressure for more efficient and economical methods of production that new trails are constantly blazed and the impossible frequently accomplished. To cite one example, the Ford company believes that in the past year it has done more practical research work on welding than any private or public interest.

It is characteristic of the Ford company—and of the entire automotive industry in fact—that it has few secrets. Any advances it has proved out it is willing to share. Few are so large that they can adopt Ford methods, but many can adapt them. In almost every process there is a hint that manufacturers even in unrelated lines can make their own, to their profit.

To serve industry, therefore, IRON TRADE REVIEW in this issue begins a series on unique metalworking processes devised by the Ford organization for the production of its new Model A. Subsequent articles will stress welding, forging and stamping processes. The story of a year's experimental and development work in the field of welding, forging and stamping, entailing the retooling of the world's largest industrial establishment and an expenditure of nearly $100,000,000 all told, must be more than interesting. It is educational and stimulating.

Recording Operations by the Movie

THOSE who attend meetings of technical societies should be impressed with the growing use of motion pictures as a means of conveying a message. For many years authors of papers have supplemented their remarks with stereopticon slides, but now there is a tendency to turn to the moving picture camera as the quickest and most accurate way to record conditions and movements.

Almost any engineering or technical convention gives evidence of the popularity of the motion picture, but a timely example was last week's machine shop practice session sponsored by the Chicago section of the American Society of Mechanical Engineers. One author employed the projector to show how automobile frames are fabricated automatically, from sheet material to completed frame. In this case, the speaker's remarks were limited to an introduction, a few explanations as the films were shown and a brief summary. Independently of technical contributions, three other films were shown to illustrate production methods.

Obviously all subjects are not capable of illustration, and for many of those which are the cost of producing film might not justify the expense. For this field the recently developed 16-millimeter film is economical and simple. With a small camera it is possible to take close-ups of machine, forging or other operations and thereby record information which otherwise would be lost.

Mine Development Work Measured

DURING the past ten years iron ore reserves of Minnesota and Michigan have been actually reduced 520,000,000 tons by shipments to blast furnaces. In the same period of years the "reserves" as estimated by the tax authorities have been reduced only 230,000,000 tons. On the face of the returns, therefore, it appears that 290,000,000 tons has been "found."

Reduction by shipments has been at the annual rate of 52,000,000 tons, while reduction in estimated reserves has been at the rate of 23,000,000 tons. What of the other 29,000,000 tons?

There has been no change in the basis for taxing ore, and actual new discoveries in the past ten years have been negligible. The figures do not include low-grade nonmerchantable ore.

The 29,000,000 tons annually can be considered

as a measure of new development. As the time operators ship ore they also prove or develop reserve deposits, and as fast as the ore is proved or developed for mining purposes it goes on the tax lists. It does not pay the operators to develop their deposits too fast, nor to lag too far behind. The rate of development when expressed in tonnage averages about half the rate of shipments. Over-development during the war period, which still is bearing down prices, is slowly but surely being corrected.

Touching on mine capacities, it is interesting to note that three mines in the Lake Superior district in 1927 shipped collectively more iron ore than was shipped from all the mines in all the southern, western and northwestern states.

Eastern Shape Fabricators Overzealous

WEAKNESS in the fabricated structural steel situation in the New York metropolitan district, an area accounting for 20 to 25 per cent of the country's structural steel, affords an apt illustration of the misconception of capacity which has injured the price fabric of so many industries recently.

The normal annual fabricating capacity in the New York district is 600,000 tons. Of this, the 10 leading fabricators are equipped to supply 445,000 tons. In 1927 demands of the New York district for structural steel totaled 512,000 tons; in 1926, 375,000 tons; in 1925, 640,000 tons; in 1924, 540,000 tons; in 1923, 450,000 tons and in 1922, 370,000 tons. Subway work, piers and bridges usually handled by four fabricators outside of New York district are not included.

For an industry to be engaged 80 per cent of capacity over a six-year period would normally be considered a happy situation. Here, as in so many other divisions of the iron and steel industry, it has been the appetite of fabricators for business in excess of their normal share that has been harmful. Inadequate co-operation between mills and fabricators has been another upsetting factor. It may be that new forms in method of quoting, in engineering and in similar services now being fostered by co-operative organizations will bring some relief.

Copper, Zinc Statistics Heartening

BE AN optimist on business" is the message of copper and zinc statistics, showing business sustained at a surprisingly high rate considering the easy trend of nonferrous metal prices and much loose talk about slack business.

Domestic users of both copper and zinc took in more last month than in any previous February. Export shipments were above the average. February shipments of copper have been topped by only a few months in history. Slab zinc shipments in January and February, at 92,525 tons, were 3000 tons larger than in the like period of 1927. Copper, at 138,613 tons, fell short 5400 tons, but only because of the weak wire situation.

These shipments of nonferrous metals, proving better than realized, were chiefly against orders placed when the markets were strong late in 1927. Only a small backlog of orders remains on producers' books, the old orders being supplemented with buying mostly for prompt shipment. The size of business has resulted in some recovery of strength in these metals, but the question naturally follows, Why should there be any weakness with such big business? The answer is not far to seek: The same sets of statistics reveal production fully in pace with demand. And the general psychological state is one of more misgiving on the maintenance of use than of output.

In other words, metal business is good as measured by the past and slack only as measured by overexpanded capacity at the mines.

What Our Readers Are Thinking

Should Be Read and Re-read

To the Editor:

The first article in your issue of February 23 has attracted my attention. It is written by Charles F. Abbott, and entitled "Are We Beginning To See Light in Distribution Problem?"

Believing that all engaged in the sale of steel should read and re-read this—perhaps because it so completely and concretely expresses my convictions on this subject—I am planning to distribute copies to our sales organization.

Very truly yours,
F. G. GIFFORD, *Vice president,*
Acme Steel Co.

Chicago, Feb. 24, 1928.

Applies Lessons Taught by War

To the Editor:

MAY I venture to congratulate both your paper and Robert E. Kinkead, through you, on the articles prepared by that gentleman and published in recent issues.

For your information, we are endeavoring to apply as far as possible some of the lessons that were taught by the late war, and our problem is more interesting because, in the writer's opinion, it is one of the greatest practical examples of "turning swords into ploughshares" that has occurred in recent times.

J. SCOTT, *General Manager,*
Transmarine Lines.

Newark, N. J., Jan. 30, 1928.

IRON TRADE REVIEW

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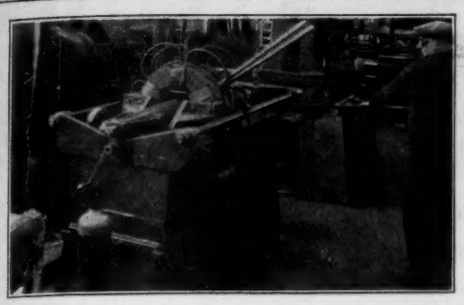

Inaugurating a series of articles on Ford Motor Co.'s new metalworking processes. Page 739.

A STUDY of earnings of 19 large manufacturing companies using steel shows that earnings on their invested capital in 1927 aggregated 18.76 per cent, compared with 18.25 per cent in 1926. Omitting General Motors from the list of 19, the other companies show earnings of 10.96 per cent in 1927, or 7 per cent less than in 1926. Earnings of some companies are exceptionally good, while for others it is a case of "profitless prosperity." The average rate of earnings for the steel consumers is larger than that for steel manufacturers. Interesting figures on pages 746 and 747.

The Readers' Page

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The Business Trend

Unemployment Conditions Improving

By JOHN W. HILL, Financial Editor

OUT of the fog of discussion of present unemployment it is difficult to separate the sheep of economic facts from the goats of political distortion. Undoubtedly there is more than normal unemployment just now. At the same time the facts are being exploited and exaggerated for whatever effect they may have upon the coming presidential campaign.

THE aggregate number of jobless has been estimated at from 1,000,000 to 5,000,000. The actual figures have not been determined, but it seems certain that the total is not nearly as great as it was in 1921. The curve of unemployment rose in January, but it has been improving since, with the expansion of industrial activities and the advance of the season for out-of-door work.

IN DETROIT, alone, employment is more than 11,000 greater than it was during the payroll peak of 1927. At Toledo employment is reported at a new high record for all time. Cleveland and other iron and steel producing centers report unemployment reductions.

UNEMPLOYMENT increased during the winter for two reasons. One was the slackening of industrial activities. The other was one cumulative effect of economies in the use of labor which industry has been adopting on a large scale in recent years. It is estimated that 7 per cent fewer workers are needed to supply the needs of 20,000,000 more people than in 1919.

THE percentage increase in labor productivity has ranged from 36 per cent in leather tanning to 59 per cent in iron and steel, 172 per cent in automobiles, and 211 per cent in rubber tires. Railroads have done likewise.

THE increase in productivity of labor and the relatively lessened numbers employed in a given industry, does not mean that the many thousands displaced by machines have been thrown out of work. A powerful process of absorption has been going on. Radio, motion picture, automobile service and other industries and trades have taken large numbers of people. The adjustment is still in progress and in the main it is proceeding without great hardship.

The Barometer of Business

INDUSTRIAL INDICATORS

	February	Month ago	Year ago	Average 1913
Pig iron output (Daily average, tons)	99,471	92,113	105,029	83,900
Blast furnace index 60 per cent—normal	52.4	52	59	62.8
Unfilled orders (tons)	4,398,000	4,275,000	3,597,119	4,503,000
Ingot output (Daily average, tons)	160,591	152,304	155,232	.....
Dodge Bldg., awards in 37 states (sq. ft.)	68,847,400	63,716,000	44,844,000	.....
Automobile output	*345,000	233,000	317,000	.....
Coal output, tons	41,290,000	44,200,000	52,905,000	39,869,000
Business failures; number	2,176	2,643	2,035	1,336
Business failures; liabilities	$45,070,000	$47,634,000	$46,940,716	$22,732,000
Cement production, Bbls.	8,785,000	9,782,000	7,377,000	7,704,000
Cotton consumption, bales	573,810	582,000	590,447	438,218
Car loadings (weekly average)	897,000	861,000	955,000	.....

*Estimated.

FOREIGN TRADE

	February	Month ago	Year ago	Average 1913
Exports	$373,000,000	$411,000,000	$373,000,000	$194,000,000
Imports	$353,000,000	$338,000,000	$312,000,000	$149,900,000
Gold exports	$ 25,776,000	$ 52,086,000	$ 2,414,000	$ 5,234,000
Gold imports	$ 14,686,000	$ 38,320,000	$ 22,302,000	$ 5,900,000

FOREIGN EXCHANGE

	Normal	March 20	Month ago	Year ago
Sterling	$4.86	$4.87	$4.87	$4.85
Francs	19.3c	3.93c	3.93c	3.91c
Lira	5.26c	5.27c	5.29c	4.54c
Marks	23.8c	23.90c	23.86c	23.73c

FINANCIAL INDICATORS

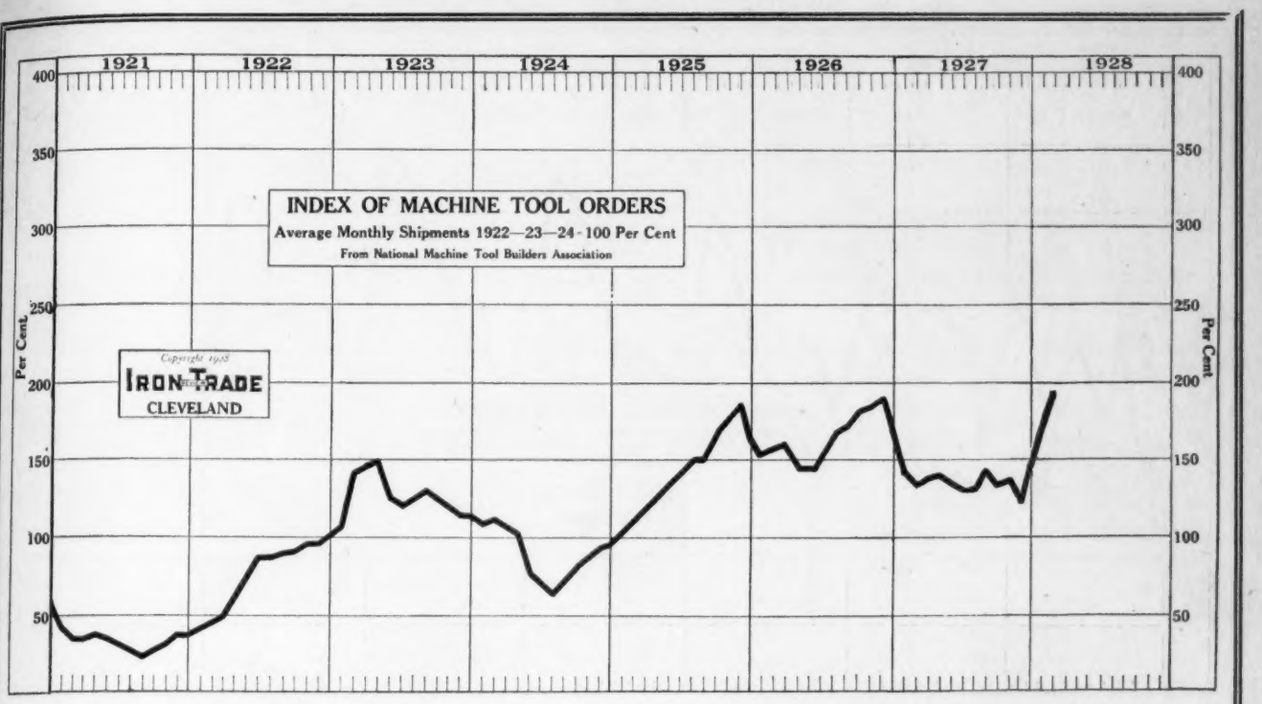
	Feb., 1928	Month ago	Year ago	Monthly average 1913
25 Industrial stocks	†$258.00	$235.15	$189.76	$58.19
25 Rail stocks	†$120.00	$113.19	$107.00	$82.90
40 Bonds	†$93.40	$92.40	$91.04	$93.00
Bank clearings (000 omitted)	$44,605,341	51,500,000	40,361,00	13,895,000
Commercial paper rate N. Y., per cent	4-4¼	4-4¼	4⅜-4½	5½
*Commercial loans (000 omitted)	8,731,419	8,617,444	8,636,916	.....
Federal Reserve ratio, per cent	74	70	77	.....
Railroad earnings	**57,070,000	55,000,000	61,578,697	59,301,000
Stock sales N. Y. stock exchange	47,009,070	56,919,395	44,162,496	6,924,000
Bond sales, par value	238,819,875	285,695,000	274,190,750	41,499,000

*Leading member banks Federal Reserve System.
**January, 1928.
†March 20, 1928.

COMMODITY PRICES

	February	Month ago	Year ago	1913
Iron Trade Review composite average of 14 iron and steel prices	$35.91	$35.62	$36.83	$26.32
Bradstreet's index	143.8	144	135.4	100
Economist's (British)	145	143	147.6	101
Wheat, cash (bushel)	1.60	1.50	1.31	92c
Corn, cash (bushel)	98c	90c	72c	51c
Petroleum, crude, (Bbl.)	2.80	2.80	3.15	2.50

The Business Trend

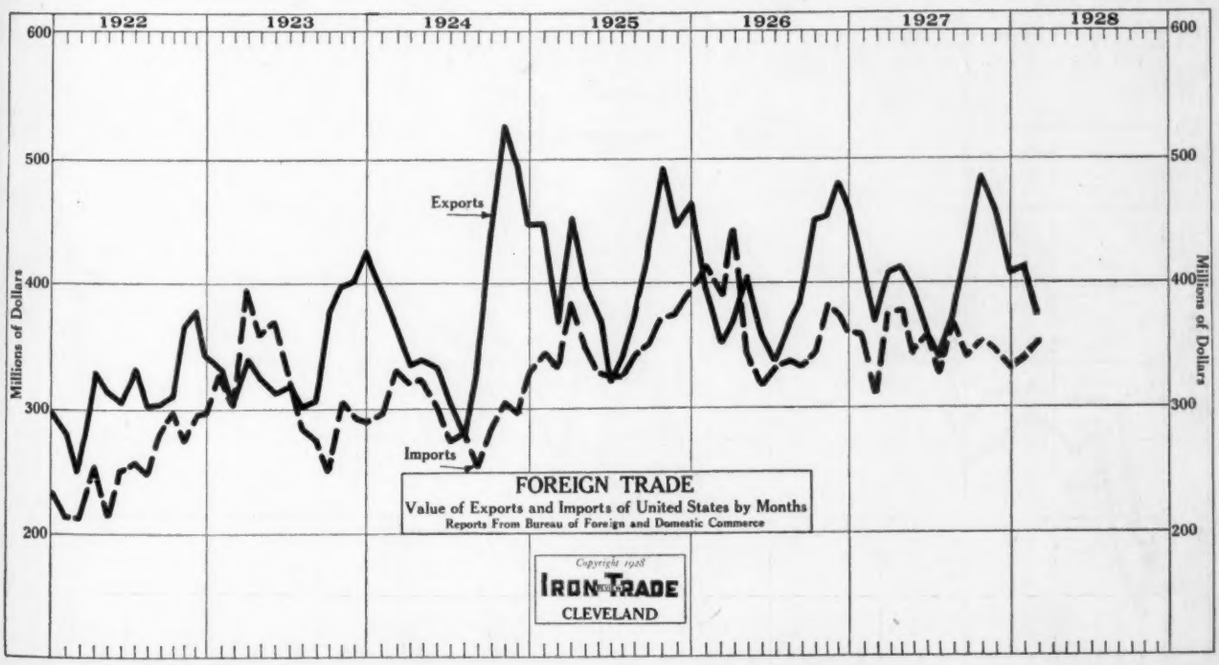


Machine Tool Orders

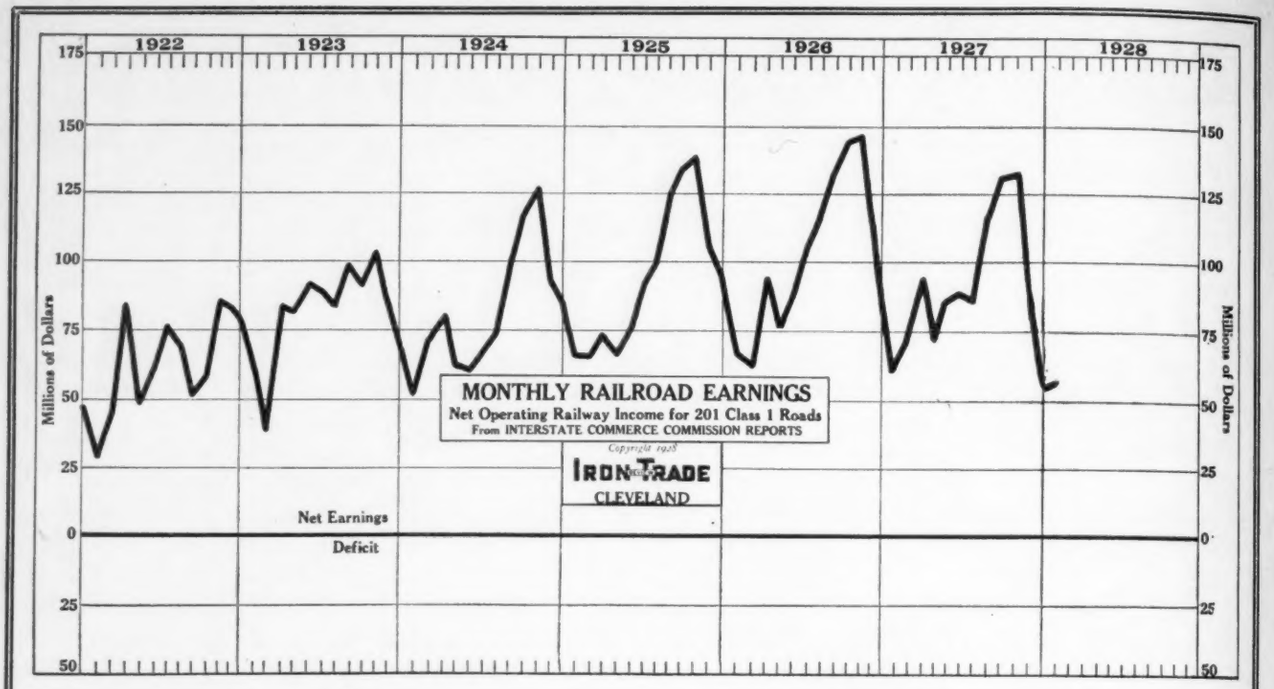
ORDERS for machine tools as computed by the National Machine Tool Builders association, have made quite a striking gain recently. In February, orders were again on a high level. This added to the large volume of buying in January combined to carry the three months' average of gross orders for machine tools to the highest point since October, 1926. The index stood at 195.8 compared with 173.6 one month before. Greater buying of machine tools reflects the striving for more efficiency.

Foreign Trade

AMERICAN exports and imports declined during February. The total for exports was $373,000,000 compared with $411,000,000 in January and $373,000,000 one year ago. Imports totaled $353,000,000 compared with $338,000,000 in February and $312,000,000 in February, 1927. Exports of gold in February declined to $25,776,000 compared with $52,086,000 in January. Gold imports were $14,686,000 compared with $38,320,000 in the preceding month. Gold exports have increased in March.



The Business Trend

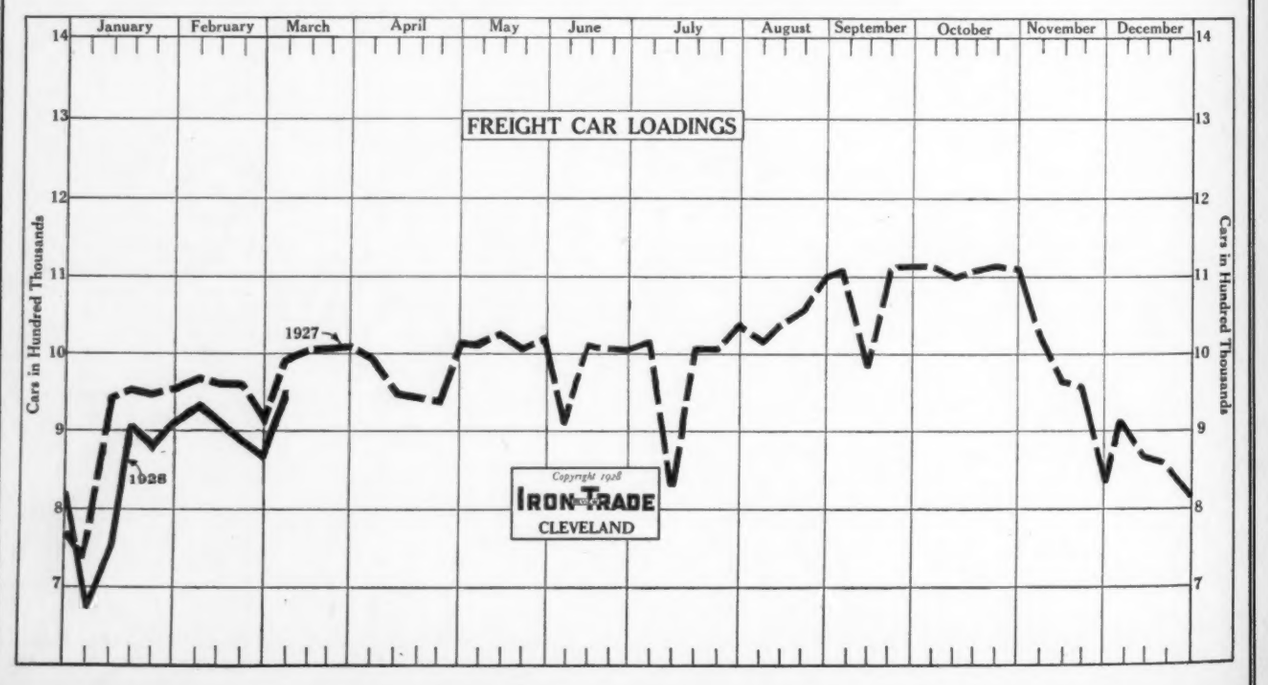


Railroad Earnings

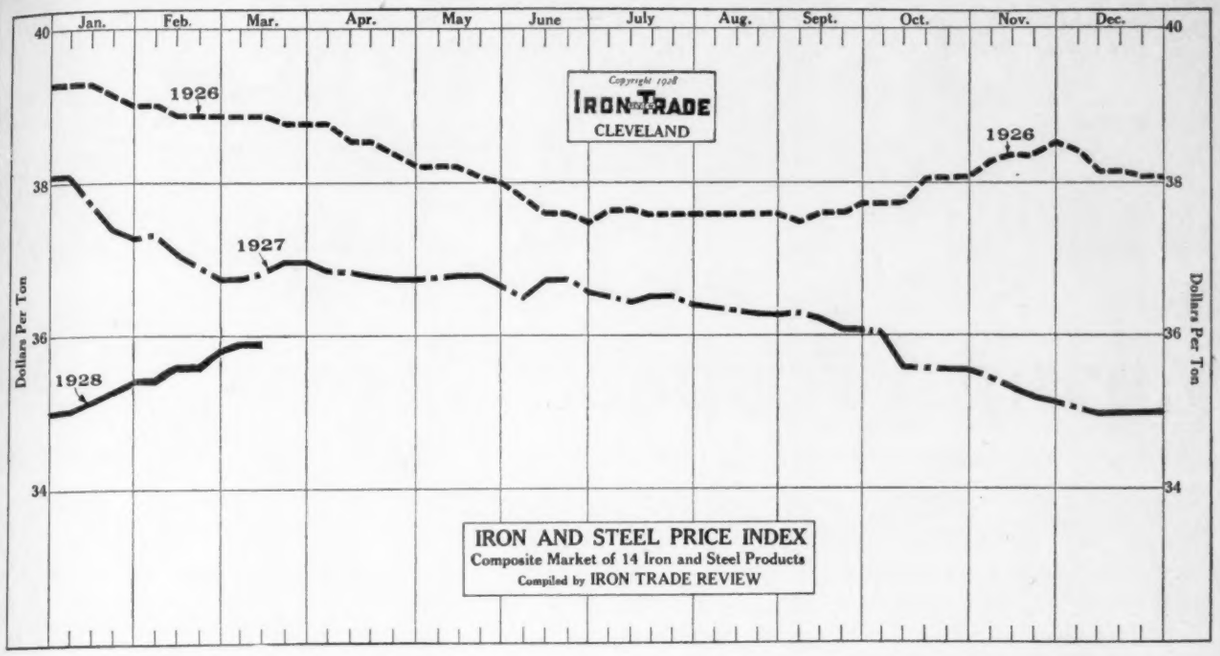
NET railway operating income of class 1 roads in January amounted to $57,070,000. This compared with $55,000,000 in December and with $61,383,597 in January, 1927. The earnings for January were at the annual rate return of 3.68 per cent on their property investment compared with 4.6 per cent on property investment reported for one year ago. Gross operating revenue for the month of January amounted to $457,173,637 compared with $486,926,520 in the corresponding month one year ago.

Freight Car Loadings

FREIGHT car loadings in the first week of March made a substantial gain over the preceding week which included Washington's birthday. Total number of cars loaded of 959,537 was the highest for any week since the middle of November. A reduction from the corresponding week of 1927 is shown, however. For that period car loadings amounted to 989,863. Most of the decrease from 1927 is accounted for by a lower shipment of coal this year, compared with one year ago.



The Business Trend

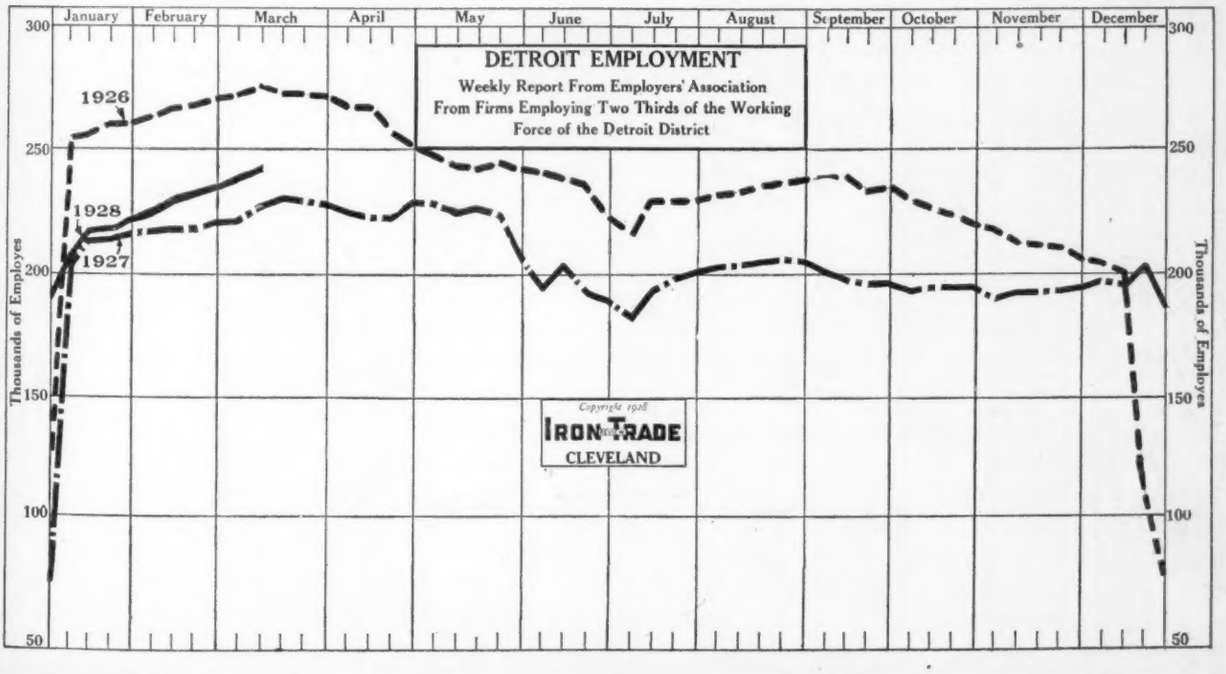


Steel Price Index

IRON TRADE REVIEW'S composite market average of iron and steel products has been holding at a steady level for the last few weeks. One week ago the index stood at $35.91 a ton, unchanged from the preceding week and comparing with the low point of $35.09 a ton in December. Since the first of the year the composite market average has advanced more than 2 per cent. This only partly offsets the decline of about 7 per cent in the average for 1927. Market tests soon will determine price tenability.

Detroit Employment

ACCORDING to the Employers' Association of Detroit, pay rolls in that manufacturing district during the period ended March 13 stood at 241,113. This was an increase of 2400 over the preceding week and one of 13,400 over the total for corresponding period one year ago. The figure represents a gain of about 11,300 workers in a month as compared with 227,613 workers employed during the week of March 15, 1927, the most active period of the preceding year.



Spring Prospect Cheers Steel

Sentiment Brighter on Fore Part of Second Quarter Though Some Have Reservations on Long Pull—General Price Situation Less Steady, with Sheets Giving Ground—Pig Iron Sales Light—Shape Inquiry Grows—Cast Pipe Prices Sag in East

WITH the second quarter just around the corner the steel industry has again taken its pulse and, after according due weight to seasonal factors, has discovered greater vitality than languishing sentiment in some quarters the past fortnight has indicated.

March promises to close with steelmaking little changed from the 83 to 85 per cent general average governing all month. The week's developments forecast at least another thirty days' good business from the automotive and building industries, now the market leaders. Production is moving directly into consumption and specifications have come easier as first quarter contracts approach their expiration date.

Sentiment on the whole is a shade brighter concerning the immediate prospect. But there is an undercurrent of opinion which, conceding practically a record first quarter and a good second quarter from the standpoint of production, is conservative over the long pull. Much of this uncertainty arises in the steel price situation, which is plainly at the peak of the present upward movement. Irregularity has developed in some of the lighter products and here, as in the heavy lines, not all of the increases sought for the second quarter will materialize.

Interest in Iron Mild

Considering the proximity of the new quarter, forward buying of pig iron has been moderate and few signs of awakening interest are manifest. Shipments, however, continue heavy, the lake furnaces being pressed to meet automotive foundry requirements and the movement at St. Louis being the best of the year. Bessemer iron is off 25 cents at Pittsburgh, to $17.25, valley, on recent transactions. Basic iron, for which a Pittsburgh steelmaker is negotiating a fair tonnage, is unsettled because Pittsburgh district furnaces continue to take advantage of their favorable freight rates. At Chicago and Cleveland some feelers for third quarter iron have appeared. An eastern Pennsylvania pipemaker has received the first 8000 tons of 30,000 tons ordered abroad.

Outlook for Shapes Up

Structural shapes, after a gap in which awards have been light and inquiries accumulating, hold a brighter promise. Fabricators are specifying at Chicago at the best rate of the quarter, and new work there totals 15,000 tons. Subway work in Brooklyn, N. Y., requires 7700 tons, while a 15,000-ton bridge at Louisville, Ky., is again active.

Plate sales at Chicago in the past two weeks have approximated 30,000 tons, chiefly for southwestern oil tanks. Western mills, with backlogs of six to eight weeks, report a better balance between sheared and universal. On plates, as in shapes and bars, the price situation is firmer at Chicago than in the Pittsburgh district. At Chicago the new 2.00c price is gaining wider acceptance but at Pittsburgh second quarter material is still available at 1.85c.

Automotive users of strip have not yet contracted sufficiently to test second quarter prices but the higher levels are holding well in the Pittsburgh, Cleveland and eastern districts. Reaffirmation of the first quarter price of 2.20c, Pittsburgh, on cold finished bars insures a greater carryover than expected. Most stripmakers and cold bar finishers are operating 75 to 80 per cent.

Sheet Prices Are Easier

Sheets show up better in sales and production than in price. February sales of independent mills, at 266,357 tons, compare with 241,951 tons last February, while production at 330,565 tons topped the 282,171 tons of last February. Specifications at Pittsburgh have been the best in two years, with shipments

The Market Section

Comparative Prices of Iron, Steel and Coke

Representative Market Figures for This Week, Last Month, Three Months and One Year Ago

	Mar. 21, 1928	Feb. 1928	Dec. 1927	Mar. 1927
PIG IRON				
Bessemer, del. Pittsburgh	$19.01	19.26	19.36	21.16
Basic, valley	17.00	17.00	17.00	18.50
Basic, eastern, del. eastern Pa.	19.50	19.50	19.25	21.00
*No. 2 foundry, del. Pittsburgh	19.01	19.01	19.01	20.16
No. 2 foundry, Chicago	18.50	18.50	18.50	20.00
*Southern No. 2 Birmingham	16.00	16.00	16.00	18.00
*Southern Ohio, No. 2 Ironton	19.00	19.00	19.00	20.00
**No. 2X, Virginia furnace	20.50	20.50	21.00	22.00
**No. 2X, eastern, del. Phila.	21.26	20.91	20.26	22.66
Malleable, valley	17.25	17.25	17.35	18.40
Malleable, Chicago	18.50	18.50	18.50	20.00
Lake Superior charcoal, del. Chicago	27.04	27.04	27.04	27.04
Gray forge, val., del. Pittsburgh	18.51	18.51	18.56	19.66
Ferromanganese, del. Pittsburgh	104.79	104.79	104.79	104.79
*1.75 to 2.25 silicon. **2.25 to 2.75 silicon.		2.75 silicon.		
COKE				
Connellsville, furnace, ovens	2.60	2.65	2.60	3.30
Connellsville, foundry, ovens	3.75	3.75	3.60	4.15
SEMIFINISHED MATERIAL				
Sheet bars, open-hearth, Youngstown	34.00	34.00	34.00	35.00
Sheet bars, open-hearth, Pittsburgh	34.00	34.00	34.00	34.00
Billets, open-hearth, Pittsburgh	33.00	33.00	33.00	33.60
Wire rods, Pittsburgh	44.00	43.50	40.00	43.00
FINISHED MATERIAL				
Steel bars, Pittsburgh	1.85	1.85	1.80	1.90
Steel bars, Chicago	2.00	1.95	1.90	2.00
Steel bars, Philadelphia	2.17	2.17	2.12	2.22
Iron bars, Philadelphia	2.12	2.12	2.07	2.17
Iron bars, Chicago	2.00	1.95	1.90	2.00
Shapes, Pittsburgh	1.85	1.85	1.80	1.90
Shapes, Philadelphia	2.07	2.08	2.08	2.12
Shapes, Chicago	2.00	1.95	1.90	2.00
Tank plates, Pittsburgh	1.85	1.85	1.80	1.90
Tank plates, Philadelphia	2.10	2.10	2.05	2.22
Tank plates, Chicago	2.00	1.95	1.90	2.00
Sheets, black, No. 24, Pittsburgh	2.80	2.85	2.75	2.90
Sheets, blue anl., No. 10 Pittsburgh	2.10	2.10	2.10	2.20
Sheets, gal., No. 24, Pittsburgh	3.75	3.65	3.60	3.70
Sheets, black, No. 24, Chicago	3.05	3.05	2.95	3.00
Sheets, blue anl., No. 10, Chicago	2.25	2.25	2.25	2.35
Sheets, galvanized, No. 24, Chicago	3.90	3.90	3.80	3.90
Plain wire, Pittsburgh	2.50	2.45	2.35	2.40
Wire nails, Pittsburgh	2.65	2.60	2.45	2.55
Tin plate, per base box, Pittsburgh	5.25	5.25	5.25	5.50
OLD MATERIAL				
Heavy melting steel, Pittsburgh	14.50	15.05	14.95	16.40
Heavy melting steel, eastern Pa.	14.00	14.00	14.00	14.75
Heavy melting steel, Chicago	12.75	12.55	11.95	13.05
No. 1 wrought, eastern Pa.	15.25	15.25	15.60	16.75
No. 1 wrought, Chicago	12.30	12.40	11.40	13.50
Rails for rolling, Chicago	14.25	15.00	14.10	15.50

Composite Market Average

The Fourteen Leading Iron and Steel Products Included Are Pig Iron, Billets, Slabs, Sheet Bars, Wire Rods, Steel Bars, Plates, Structural Sharpes, Black, Galvanized and Blue Annealed Sheets, Tin Plate, Wire Nails and Black Pipe

This week (March 21, 1928)	**$35.70**
Last week (March 14, 1928)	**35.91**
One month ago (February, 1928)	**35.62**
Three months ago (December, 1927)	**35.09**
One year ago (March, 1927)	**36.83**
Ten years ago (March, 1918)	**56.71**
Fifteen years ago (March, 1913)	**27.93**

correspondingly good. The leading sheet interest has expanded its rate four points this week, to 86 per cent. But black sheets have yielded $2 to $3 per ton under the asking price of 2.90c, Pittsburgh, and galvanized now are at a range of 3.65c to 3.75c. On light sales, autobody sheets have held at 4.15c.

Cast iron pipe prices, now making a show of strength in other markets, have broken at New York to the lowest point in months. On 5355 tons of 8 and 12-inch sections the low bid was equivalent to $24.75, Birmingham, or $6 under the market. Spring buying of pipe is opening up.

After rising without a break since early January the IRON TRADE REVIEW composite of fourteen leading iron and steel products is down 21 cents this week to $35.70. This results from weakness in black sheets, bessemer pig iron and willingness of Pittsburgh district mills still to sell heavy steel at 1.85c instead of asking the full advance to 1.90c.

Late News Flashes

Pittsburgh Holds at 75 to 80 Per Cent

Pittsburgh, March 20.—Steelmaking still averages 75 to 80 per cent. Weirton Steel Co. is at a record rate this month, with 10 out of 11 open hearths on. The mill at Monessen, Pa., has 10 open hearths out of 12 active, one at Butler, Pa., and one at Midland, Pa., each 6 out of 10. Both Jones & Laughlin Steel Corp. and Carnegie Steel Co. approximate 80 per cent. Some curtailment is reported at Steubenville, O. American Sheet & Tin Plate Co. is up to 86 per cent at some units; it has started two units at New Philadelphia, O., making all 12 active. All 40 of its Shenango mills will be on March 26.

Steel Plate Orders Gain in February

Washington, March 20.—New orders for fabricated steel plate gained in February, totaling 49,588 tons as reported to the department of commerce by 51 makers.

Du Pont Stock Probe to Continue

Washington, March 20.—The investigation inaugurated by the federal trade commission being an economic one, the fact that E. I. du Pont de Nemours & Co. have sold their 114,000 shares of United States Steel Corp. common stock will not halt the proceedings, Chairman Humphrey said today.

Valley Stack Is Blown In

Youngstown, O., March 20.—An additional stack was lighted March 16 by Youngstown Sheet & Tube Co. Blast furnace activity now is at 70 per cent of rated capacity. However, open hearth activity this week is down to 42 furnaces out of 57 independent units, against 47 last week. Tin plate production is at capacity, and strip at 95.

Current Rolled Steel Prices

PRICES, CENTS PER POUND, UNLESS OTHERWISE STATED

Semifinished Material

Prices per gross ton

BILLETS AND BLOOMS

4 x 4-inch base

Pittsburgh, open-hearth	$33.00
Pittsburgh, bessemer	33.00
Youngstown	33.00
Cleveland	33.00
Philadelphia	38.30
Chicago	34.00
Forging, Pittsburgh	39.00
Forging, Philadelphia	43.30

SHEET BARS

Pittsburgh, Youngstown	$34.00
Cleveland	33.00
Chicago	35.00

SLABS

Pitts., Young., and Cleve.	$33.00

WIRE RODS

Pittsburgh, Cleveland	$44.00
Chicago	45.00

SKELP

All grades, Pittsburgh	1.85c to 1.90c

Standard Structural Shapes

Pittsburgh	1.85c to 1.90c
Philadelphia, del.	2.07c to 2.18c
New York, del.	2.14c to 2.19c
Boston, del.	2.265c to 2.415c
Chicago	2.00c
Cleveland, del.	2.04c to 2.09c
Buffalo	2.00c
Bethlehem	2.05c
Birmingham	2.00c to 2.05c
Pacific coast, c.i.f.	2.35c

Steel Plates

Pittsburgh	1.85c to 1.90c
Philadelphia, del.	2.10c
New York, del.	2.175c
Boston, del.	2.265c to 2.415c
Chicago	2.00c
Cleveland	2.04c to 2.09c
Buffalo	2.00c
Coatesville, Sparrows Point..	2.05c
Birmingham	2.00c to 2.05c
Pacific coast, c.i.f.	2.25c to 2.30c

Iron and Steel Bars

Pittsburgh, soft steel	1.85c to 1.90c
Pittsburgh, cold finishing	2.00c to 2.05c
Pittsburgh, forging quality..	2.10c to 2.15c
Philadelphia, soft steel	2.17c
New York, soft steel	2.19c
Boston, del.	2.265c to 2.415c
Chicago, soft steel	2.00c
Cleveland, soft steel, mill	1.90c
Cleveland, soft steel, del.	1.92½c and 2.09c
Birmingham, (soft steel)	2.00c to 2.05c
Buffalo	2.00c
San Francisco, soft steel	2.35c
Pittsburgh, refined iron	2.75c to 4.25c
Chicago, reinforcing billet	2.30c to 2.75c
Pitts., reinforcing billet	1.90c
Chicago, reinforc. rail steel	1.85c to 1.95c
Youngstown, reinf. billet, base	1.90c to 2.00c
Chicago, rail steel	1.85c
Rail steel, mill	1.65c to 1.75c
Philadelphia, common iron	2.12c to 2.22c
New York, common iron	2.14c to 2.24c
Chicago, common iron	2.00c

Hoops, Bands, Strips

Hot strip, under 3-inch, Pitts.	2.20c to 2.40c
Hot strip, 3 to 6-inch, Pitts.	2.10c to 2.20c
Hot strip, 6 to 12-inch, Pitts.	1.90c to 2.00c
Hot rolled strip, 12 to 24-inch, 16 gage and heavier, coils or cut lengths, 1.90c plate basis, or 2.10c blue annealed basis, plate or sheet extras.	
Hot strip, under 3-in., Chi.	2.30c to 2.50c
Hot strip, 3 to 6-in., Chi.	2.20c to 2.30c
Hot strip, 6 to 12-in., Chi.	2.00c to 2.10c
Hot strip, 12 to 24-in., Chi.	1.95c plate base
Cold rolled strip, hard coils, 1½ inches and wider by 0.100-inch and heavier base, Pitts., Cleve., (under 3 tons)	3.15c
Worcester, Mass.	3.40c

Cold Finished Steel

Cold finished steel bars, drawn or rolled, Pitts., Chi., c.l.	2.20c
Shafting (turned, polished) Pitts.	2.20c
Shafting (turned, ground) mill (Depending on size, 1 3/16 to 7-inch)	2.45c to 2.90c
Cold finished steel bars, Cleve.	2.25c

Chain, Piling, Cut Nails

Cut nails, c.l., f.o.b. mills	2.80c
Chain, 1-in. proof coil, Pitts.	6.00c
Sheet piling base, Pittsburgh	2.25c to 2.35c

Alloy Steel

Hot Rolled

F.o.b. Pittsburgh or Cleveland
Alloy Quality Bar Base is 2.65c

S.A.E. Series Number	Alloy differential	Net price 100 lb. bars
2000	0.25	$2.90
2100	0.55	3.20
2300	1.50	4.15
2500	2.25	4.90
3100	0.55	3.20
3200	1.00	3.65
3400	3.20	5.85
3300	3.80	6.45
4100 0.15-0.25 Mo.	0.50	3.15
4100 0.25-0.40 Mo.	0.70	3.35
4600 0.20-0.30 Mo., 1.25-1.75 Ni.	1.05	3.70
5100 0.60-0.90 Cr.	0.35	3.00
5100 0.80-1.10 Cr.	0.45	3.10
5100 Chrome Spring	0.20	2.85
6100 Bars	1.20	3.85
6100 Spring Steel	0.95	3.60
Chrome Nickel Vanadium	1.50	4.15
Carbon Vanadium	0.95	3.60
9250	0.25	2.90

Hot rolled billets 4 x 4-in. and over take same price gross ton as same specification bars net ton. Sizes from 4 x 4-in. down to 2½ x 2½-in. same basis plus $5 a ton extra. Smaller billets take bar price on net ton basis. Slabs with section area 16 in. or over take billet price, from 12 to 16 in. $5 extra, under 12-in. bar price.

Sheets

Sheet Mill Black

No. 24, Pittsburgh base	2.80c to 2.90c
No. 24, Philadelphia, delivered	3.07c to 3.22c
No. 24, Gary, Indiana Harbor	3.00c
No. 24, Chicago, delivered	3.05c
No. 24, Birmingham, base	3.05c

Tin Mill Black

No. 28, Pittsburgh	2.90c to 3.00c
No. 28, Gary, base	3.00c to 3.10c

Galvanized

No. 24, Pittsburgh base	3.65c to 3.75c
No. 24, Philadelphia, delivered	4.07c
No. 24, Gary, Indiana Harbor	3.85c
No. 24, Chicago, delivered	3.90c
No. 24, Birmingham, base	3.90c

Blue Annealed

No. 10, Pittsburgh, base*	2.00c to 2.10c
No. 10, Philadelphia, delivered	2.42c
No. 10, Gary, Indiana Harbor	2.20c to 2.30c
No. 10, Chicago, delivered	2.25c to 2.35c
No. 10, Birmingham base	2.30c

*Plus 10 cents for 40 inches or wider.

Automobile

No. 20, Pittsburgh base	4.15c

Iron

No 10, Pitts., blue ann., c.l.,	2.80c
No. 24, Pitts., box annealed, 1-pass cold rolled, carload	3.75c
No. 24, Pitts., gal., c.l.	4.85c

Tin and Terne Plates

Prices per 100-pound box, Pittsburgh

*Tin plate, coke base	$5.25
Gary, Ind., base 10 cents higher.	
Long ternes, primes, No. 24	4.10c

*Prices subject to quantity differentials.

Wire Products

To Jobbers in Carloads

Dealers 5 cents per 100 pounds extra f.o.b. Cleveland and Pittsburgh base.

Bright plain wire, No. 9 gage	2.50c
Annealed fence wire	2.65c
Galvanized wire, No. 9 gage;	3.10c
Barbed wire, painted	3.10c
Barbed wire, galvanized	3.35c
	Per 100 lbs.
Wire nails	$2.65
Galvanized nails	4.65
Polished staples	3.10
Galvanized staples	3.35
Coated nails, 100 lb. kegs, subject to Sept. 1, 1926, extra, base	2.65
Woven wire fencing (retailers) 12½ gage, 26-in. high 7-in. bars and 12-in. stays, per 100 rods, f.o.b. Pitts.	$20.03

Joliet, DeKalb and Waukegan, Ill., Anderson, Ind., and Chicago prices $1 per ton over Cleveland-Pittsburgh base on products made there; Duluth $2 higher, Worcester, Mass., and Fairfield, Ala., $3 higher.

Rails, Track Material

Standard bessemer rails, mill	$43.00
Standard open-h'th rails, mill	43.00
Relaying rails, St. Louis	24.00 to 31.00
Relay, rails, Pitts. 60 to 90 lb.	27.00 to 30.00
Light rails, 25 to 45, mills	36.00
Angle bars, Chicago base	2.75c
Spikes, railroad, Pittsburgh	2.75c to 2.80c
Spikes, small railroad, 7/16-inch and smaller, Pitts.	2.80c
Spikes, boat and barge, Pitts.	3.10c
Spikes, railroad, Chicago	2.80c
Track bolts, Pitts., stand.	70 off list
Track bolts, Chicago	3.80c
Tie plates, Chicago, Pitts.	2.15c

Iron and Steel Pipe

Base Discounts Pittsburgh and Lorain, O., to Jobbers in Carloads

	Black	Galv.
1 to 3-inch butt steel*	62	50½
1 to 1½-inch butt iron	30	13

Indiana Harbor, Ind., and Evanston, Ill., 2 points less, Chicago del., 2½ points less.

*To large jobbers these discounts are increased on black by 1 point and a supplementary discount of 5 and 5 per cent; on galvanized by 1½ points with a supplementary 5 per cent.

Boiler Tubes

Carload Discounts—Less-carloads 4 points Lower—F.o.b. Pittsburgh Mills

Steel 3¼ to 3¾-inch	42½
Charcoal iron, 3¼ to 4½-inch	9
Seamless hot rolled 3¼ to 3½-inch	46

Further discounts of five to seven 5 per cents for carloads on lap welded steel. On seamless hot rolled several more 5 per cents, and on charcoal from one 10 per cent to two 10 and one 5 per cents.

Cast Iron Water Pipe

Prices per net ton

Class B Pipe

Six-inch and over, Birming'm	$30.00 to 31.00
Four-inch, Birmingham	34.00 to 35.00
Four-inch, Chicago	41.20 to 42.20
Six-inch to 24-inch, Chicago	37.20 to 38.20
Four-inch, New York	40.25 to 41.60
Six-inch and over, New York	36.75 to 37.75
Standard fittings, Bir. base	$100.00

6 to 24-inch, base; over 24-inch, plus $20; 4-inch, plus $10; 3-inch, plus $20; gas pipe fittings, $5 higher.

Class A pipe is $4 higher than Class B.

Bolts and Nuts

F.o.b. basing points, Pittsburgh, Cleveland. Birmingham and Chicago.

Discounts are for legitimate jobbing or large consuming trade purchasing in full-case lots, apply to lists of April 1, 1927. Small lots are 55 to 60 per cent off.

CARRIAGE BOLTS

All sizes, cut thread	70 off

Rolled thread ⅜x6 and smaller take 10 per cent lower list.

Eagle list	70 off

MACHINE BOLTS

All sizes, cut thread	70 off

Rolled thread ⅜x6 and smaller take 10 per cent lower list.

Lag screws	70 off
Plow bolts, Nos. 1-2-3-7 heads	70 off
Tap bolts	70 off
Blank bolts	70 off
Stud bolts without nuts	70 off

Stove bolts, 75, 20, 10 and 5 off in pkgs. 75, 20, 10 and 5 with 2½ off in bulk.

Tire bolts	60-5 off

NUTS

Semifinished	70 off

HEXAGON CAP SCREWS

Milled	80-10-10 off
Upset 1-in. diam. and smaller	85-5 off

SQUARE HEAD SET SCREWS

Milled	80-10 off
Upset, 1-in. diam. and smaller	80-10-10 off

Rivets

Struct., c.l., Pitts.-Cleve.	2.90c
Structural rivets, c.l, Chicago	3.00c
**Rivets, 7/16-inch and smaller, Pitts.	70 and 10 off

Chi., Cleve. 70 and 10 to 70, 10 and 5 off

**Some makers quoting 70 off with freight allowed on 300 pounds or more.

Washers

Wrought, c.l., Pitts. dist.	$6.75 off
Wrought, c.l., Chicago dist.	$6.70 to 6.90 off
Lock washers; To dealers,	85-5 off;
to users	85 off

Pig Iron

Market Is Quieter, with Shipments Continuing Heavy—Bessemer Down 25 Cents in Valley—Inquiries Appear for Third Quarter

PIG iron sales for second quarter are tapering off, while inquiries are beginning to appear for third quarter. Current shipments, however, continue at a high rate, exceeding production by many merchant interests. Prices in most districts are firm, but some deflection is noted in recent sales at Pittsburgh. A sheetmaker bought 2000 tons of bessemer at a price equivalent to below $17.50, valley, while other buyers have closed at $17.25, or 25 cents under the recent minimum price. Sellers are restoring 50-cent differentials on foundry iron. The general price now on small lots is $17.25, base, valley. One maker booked 1000 tons of No. 1 iron at $18.25, valley, the General Electric Co. is inquiring for several thousand tons for various plants for second quarter.

PITTSBURGH, March 20.—Occasional transactions in the pig iron market interrupt the long tedium. A nearby sheetmaker is understood to have bought at least 2000 tons of bessemer iron in a three-way deal between itself, an electric company affiliation, and a steelworks interest. The exact basis is not known, except that the price is below the equivalent of $17.50, valley. That price occasionally is available on small lots, although some buyers have been able to close at $17.25, valley, marking a decline of 25 cents from the recent minimum. The market for basic iron is unclarified, valley producers refraining from negotiating in this district because local steelmakers name low prices on account of favorable freight rates. The Allegheny Steel Co. is understood to be negotiating for a large tonnage of basic. Sellers of foundry iron are restoring 50-cent silicon differentials. For instance, one valley producer sold 1000 tons of No. 1 at $18.25, and a smaller tonnage of No. 2X at $17.25. These prices are equivalent to $17.25, base, valley. That price applies on small sales of foundry and malleable iron. The Pittsburgh Malleable Iron Co., using two to three carloads weekly, bought a small tonnage.

Boston, March 20.—The pig iron market remains quiet. The only attractive order in the past week was 1000 tons purchased from a Buffalo furnace by the Westinghouse Electric & Mfg. Co. for Springfield, Mass.; 400 tons was No. 2X and the rest No. IX. It is reported the buyer did better than $16.50, base, Buffalo. Other business was limited to small lots at $17, base, Buffalo. Sales have included a small amount of Indian iron on a basis of $21.75 to $22.00 on dock, duty paid, about equivalent to No. 2X.

Buffalo, March 20.—General Electric Co.'s inquiry for 2900 tons of iron for various plants is the largest reported this week. Other inquiries bring the total to about 5000 tons. The last week's sales included one lot of 2000 tons of foundry iron. The Buffalo base price is $17 for foundry and $17.50 for malleable, subject only to concessions which some steelworks will make on large eastern inquiry. Furnace operation is unchanged, with 12 stacks in blast and nine idle.

New York, March 20.—Pig iron sales in the past week aggregate less than 5000 tons. Inquiry of Abendroth Bros., Port Chester, N. Y., has not been closed. General Electric Co. is inquiring for several thousand tons of foundry for various plants. Eastern Pennsylvania foundry iron as a rule continues $20, base, furnace. Buffalo foundry is $17, base, furnace, with $16.50 quoted in some instances. Eastern New York state foundry iron usually is $18, base, furnace. Indian iron is bringing $20.50 to $21, base, duty paid, and Dutch high silicon iron ranges from $21 to $21.50, duty paid.

Pig Iron Prices

Per Gross ton

Bessemer, valley furnace	$17.25 to 17.50
Bessemer, del., Pittsburgh	19.01 to 19.26
Basic, valley furnace	17.00
Basic, del., Pittsburgh	18.13 to 18.76
Basic, Buffalo furnace	17.00
Basic, del., eastern Pa.	19.25 to 20.25
Malleable, valley furnace	17.25
Malleable, del. Pittsburgh	19.01
Malleable, del. Cleveland	18.50
Malleable, Chicago furnace	18.50
Malleable, Buffalo furnace	17.50
Malleable, del. eastern Pa.	20.00 to 21.00
No. 1 foundry, Chicago furnace	19.00
No. 1X, eastern del., Phila.	21.76
No. 1X, Buffalo furnace	18.50
No. 2 foundry, valley furnace	17.25
No. 2 foundry, del., Pittsburgh	19.01
No. 2 fdy., Everett, Mass., fur.	19.00 to 21.00
No. 2 foundry, Buffalo furnace	17.00
No. 2 foundry, Chicago furnace	18.50
No. 2 foundry, Granite City	19.50
No. 2 foundry, Ironton furnace	19.00
No. 2 foundry, del. Cleveland	18.50
No. 2 foundry, del. Phila.	20.76
No. 2 Virginia furnace	20.00 to 20.50
No. 2 foundry, N. J., tidewater	19.78 to 21.76
No. 2 foundry, east N. Y. fur.	18.00
No. 2 Alabama, Birmingham	16.00
No. 2 Alabama, del. Cincinnati	19.69
No. 2 Tenn., Birmingham base	16.00
No. 2 Tenn., del., Cincinnati	19.69
No. 2 Alabama, del. Philadelphia	22.01
No. 2 Alabama, del. Chicago	22.01
No. 2 Ala., del. Chicago, river-rail	20.18
No. 2 Alabama, del. Cleveland	22.01
No. 2 Alabama, del. St. Louis	20.42
No. 2X, east. N. J., tidewater	20.28 to 21.26
No. 2X, eastern, del. Phila.	21.26
No. 2X, foundry, Buffalo furnace	17.50
No. 2X, eastern, del. Boston	23.15 to 23.65
No. 2X, Virginia furnace	20.50 to 21.00
No. 2X, Virginia, del. Phila.	25.04 to 25.54
No. 2X, Virginia, del. Jersey City	25.37 to 25.87
Gray forge, val., del., Pittsburgh	18.51
Low phos., standard, valley	27.00
Low phos. standard, Phila.	24.76 to 27.29
Low phos., copper bearing fur.	23.00 to 23.50
Charcoal, Birmingham	28.00
Charcoal, Superior, del. Chicago	27.04

Silvery iron, Jackson county (Ohio) furnace, in per cents: 5—$22; 6—$23; 7—$24; 8—$25; 9—$26; 10—$28; 11—$30; 12—$32; 13—$34.

Bessemer ferrosilicon, Jackson county (Ohio) furnace, in per cents: 10—$30; 11—$32; 12—$34; 13—$36; 14—$38; 15—$40.50; 16—$43.

Cleveland, March 20.—New pig iron demand is gradually subsiding, sales in the past week reported by furnace interests here amounting to 23,000 tons. Improvement is not expected until spring construction work is well under way. Business developing from that source has been disappointingly small, and some iron booked for delivery in first quarter will have to be carried over. The automotive industry, however, has been taking more than anticipated. Leading merchant producers are shipping more than they are making. The Nordyke & Marmon Co., Indianapolis, is reported to have closed with a lake furnace for part of its recent inquiry for 3000 tons, while the inquiry for 1000 tons from a stove foundry in Kokomo, Ind., still is pending. The first inquiries for third quarter were noted this week, one furnace interest receiving several, aggregating 4000 tons. This interest and others who received inquiries are not naming prices for that delivery. Cleveland furnaces continue to quote $18, base, furnace, in the 50-cent switching area, and $17, base, furnace, is the general quotation in outside territory. A lake furnace price of $17.50 is noted in some districts, while the price in the southern Michigan territory is $18, base, furnace.

Cincinnati, March 20.—The market is quiet in comparison with a few weeks ago. The Louisville & Nashville railroad wants 520 tons of foundry iron and 70 tons of charcoal iron. Cincinnati sellers also have received the inquiry for 1000 tons of 2.25 to 2.75 per cent silicon iron for second quarter delivery to a stoveworks in Kokomo, Ind. Sales noted in the past week include 500 tons of silveries to a Michigan melter, and other miscelleneous lots of silveries; also a few small lots of foundry iron. Prices are steady.

Chicago, March 20.—Some interest is being shown in third quarter pig iron and a few sales have been closed, but it is expected that inquiries for that period will not gather momentum for some weeks. The heavy buying of last month and early March has tapered off as far as tonnage is concerned, but spot inquiries are reported fairly numerous. Sales of 100 to 300-ton lots have been active during the week. Sales of 100 to 300-ton lots have been active during the week. Resistance to the base price of $18.50, Chicago furnace, is reported light, and

(*Concluded on Page 779*)

Coke

Sales Indicate Larger Foundry Operations—New Demand from Blast Furnaces Is Light

DEMAND for foundry continues to reflect an increase in the melt, and prices of this grade are firm. The market for blast furnace fuel is less active and orders come mainly from non-metallurgical users. Gas producers placed substantial orders for beehive coke during the week at prices around $2.60 to $2.75. A Cleveland steelworks has arranged for the purchase of approxi-

Pittsburgh, March 20.—Featured in the beehive coke market are a number of inquiries from gas producers, several involving two to four carloads daily for one year beginning April 1. Two others require substantially larger tonnages. Blast furnaces are not buying in the spot market. The latest inquiry from furnaces involved 20 carloads at the rate of a carload per day. This was closed several days ago, and a coke producer who quoted $2.85 failed to get the order. Other spot market sales for non-metallurgical purposes are noted at $2.60 to $2.75. Two single carloads were sold to consumers yesterday at $2.85. Inquiries from blast furnaces for second quarter are scarce, and as high as $3 is quoted for that delivery. The Shenango Furnace Co. has not yet closed for its requirements. Demand for heating coke is small; prices are around $2.50. Contracting for foundry coke for second quarter is about finished. Spot prices range from $3.75 to $4.75. Premium brands bring $5.10.

The coal market is featured by a sale of slightly less than 500,000 tons of Fairmount, W. Va., by-product coking coal, to the Otis Steel Co., Cleveland, dependent upon quality being satisfactory. The price is understood to be 25 cents less than the lowest possible delivered price on coal from western Pennsylvania mines, on which the freight rate is at least 15 cents higher than from Fairmount. The Trumbull Steel Co. has not yet arranged for its purchases.

Production of coke in the Connellsville region in the week ended March 10 was 65,570 tons, against 64,790 tons the preceding week, according to the *Connellsville Courier*.

Boston, March 20.—Coke producers continue to get emergency calls for carlots, but this does not signify any increase in melt. Prices hold at $11.50, delivered in New England, for the foundry grade.

New York, March 20.—Fair specifications are being issued by foundries on coke contracts. Premium brands of beehive foundry coke for spot shipment usually are held at $5 to $5.10, Latrobe, Pa., equivalent to $8.71 to $8.81, delivered at Newark and other northern New Jersey consuming points. By-product foundry coke in northern New Jersey continues $8.30, ovens, equivalent to $9 to $9.40, delivered at Newark. The delivered price of by-product foundry coke at most New England foundry centers continues $11.50.

Buffalo, March 20.—Sales of coke indicate increasing foundry operations. The new Buffalo price on foundry coke is $8.50, ovens, and considerable contracting for future delivery has been done at this level.

Cincinnati, March 20.—Shipments of foundry coke this month are ahead of the January and February rates. All by-product coke producers report satisfactory business. Prices are unchanged.

Chicago, March 20.—Specifications of by-product foundry coke against first half contracts are steady and indicate a slight gain in foundry activity in this district. The price is $9.50 for local delivery, and $9, ovens, for outside.

St. Louis, March 20.—The coke market is slightly more active. Western and southwestern melters are inquiring for prices for shipment through second and third quarters. By-product interests here are not anticipating any shortage, even should the miners in Indiana and Illinois stop work next month. Prices are slightly firmer.

Birmingham, Ala., March 20.—Coke production is steady. Prices are reported firm, $5 being stated as the base for the foundry grade. Tennessee Coal, Iron & Railroad Co.'s new by-product ovens at Fairfield are coming up to expectations. Greater output of coke at this point will be needed shortly when new blast furnaces are lighted.

Coke Prices

Beehive Ovens

Prices per Net Ton

Connellsville furnace	$2.60 to 2.85
Connellsville foundry	3.75 to 4.25
New River foundry	7.00 to 8.00
New River furnace	6.00
Wise county foundry	5.00
Wise county furnace	4.50
Alabama foundry	5.00

By-Product Foundry

Newark, N. J., del	9.00 to 9.40
Chicago, ovens	9.00
New England, del.	11.50
St. Louis	9.75
Birmingham	5.00
Indianapolis, del.	9.75
Ashland, Ky.	7.50
Portsmouth, O.	7.50
Detroit, ovens	9.00
Buffalo, ovens	8.50

Data on the coefficient of expansion of low-carbon iron chromium alloys of the so-called stainless iron type are presented in scientific paper No. 570 of the bureau of standards.

Ferroalloys

Shipments Are Heavy—New Orders Light—Prices Steady

New York, March 20.—Ferromanganese shipments are going forward to consumers at a heavier rate than in January and February. Consumers appear to have used up stocks. New demand is light. While there has been little opportunity to test the market, $100, duty paid, tidewater, continues firm. Spiegeleisen specifications shows a slight falling off so far in March as compared with January and February. New demand is restricted to occasional carloads. These are bringing $32, furnace, for 19 to 21 per cent. Some contracts will come up for renewal about April 1. Foreign prices are such that it would be difficult to offer material here at less than $33 to $33.50, duty paid, tidewater. This is too high, compared with the domestic price, to attract orders except possibly from certain points that are reached from New Orleans. Only one furnace is said to be producing spiegeleisen for the market in this country. Stocks at two other furnaces which produced spiegeleisen last year now have been nearly liquidated.

Special ferroalloys are going at unchanged prices but practically all business is on contracts. Shipments are good. A little business has been done in wolframite, tungsten ore, and the market is firm at $10.25 to $10.50 a short ton unit, duty paid, with asking prices mainly near the top figure.

Pittsburgh, March 20.—Ferroalloy shipments continue heavy. No spot market activity is noted. The price is steady at $100, base, seaboard. Spiegeleisen shipments appear to be steadily increasing. Some customers already have absorbed large portions of their second quarter quotas, and additional purchases may be made before May 1. The spot market is firm at $32 on 19 to 21 per cent.

Ferroalloy Prices

Ferromanganese, 78 to 82 per cent, tidewater, duty paid	$100.00
Ferromanganese, del. Pittsburgh	$104.79
Spiegeleisen, 19 to 21 per cent domesitc furnace	32.00
*Ferrosilicon, 50 per cent, freight allowed, carloads	83.50
*Do, less carload	88.50
Do, 75 per cent	130.00 to 150.00
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. per lb. con., del.	11.00
Do., for spot delivery	11.50
Ferrotungsten, stand., lb. cont.	93.00
Ferrovanadium, 30-40 per cent, per lb., contained, on analysis	3.15 to 3.65
Ferro-carbon-titanium, carload, producers plant, net ton	200.00
Ferrophosphorus, per ton, carload, 17 to 19 per cent, Rockdale, Tenn., basis (18 per cent)	91.00
Ferrophosphorus, electrolytic, per ton, carload, 23-25% f.o.b. Anniston, Ala. (24 per cent)	122.50

*These prices contract; spot $5 higher.

The Market Section

Plates

New Buying Tops Last Month's Rate—Second Quarter Tonnage Contracts Booked at 1.85c

TONNAGE buyers of plates still are able to do 1.85c, base, Pittsburgh, for second quarter, while 1.90c has become the asking price for small lots. Specifications on low price contracts for first quarter are increasing as the end of this period approaches. New business is ahead of last month, leading makers report. Some additional tank jobs have been awarded at Chicago.

PLATE PRICES, PAGE 764

Pittsburgh, March 20.—Plate mills continue to operate on a fair basis, discharging numerous small orders as received. While protections are asked on fairly large lots, most orders involve less than 500 tons for stand pipes, tanks or water towers, small gas holders and boilers. March 22 is the date scheduled for an award by the Mississippi river commission, Vicksburg, Miss., of 12 composite wood and steel barges, but as only the frames are steel they will require 350 tons. Mills are receiving specifications against low price contracts to be finished March 31. Progress is made in booking second quarter contracts at 1.85c, the 1.90c price being reserved for small spot lots. American Bridge Co. has received formal award of 41 barges for Mississippi river commission involving 4775 tons instead of 4750 tons as listed in IRON TRADE REVIEW, March 8.

New York, March 20.—Specifications for plates on first quarter contracts continue good. Current demand comes from miscellaneous sources and is indicative of fairly good consumption. On new business 2.05c, base, Coatesville, is the minimum, and no shading is reported.

Chicago, March 20.—Plate mills report better balance in production of universal and sheared plates, with lengthening of orders for the latter. Deliveries are four to six weeks deferred, and mills report order backlogs of six to eight weeks. Inquiry is out for 5000 tons of tonnage to be erected by a local builder in the West Texas oil fields. No additional tankage orders were placed during the week. Orders closed in the past two weeks amounted to 25,000 to 30,000 tons. Some tonnage is being contracted for second quarter at 2.00c, Chicago. Specifications on 1.90c and 1.95c contracts are continuing at a heavy rate.

Philadelphia, March 20.—Plate demand has subsided, although the price continues firm at 2.05c, base, Coatesville, on new business. Eastern mills continue to operate around 60 per cent.

Cleveland, March 20.—Plate users with first quarter contracts priced at 1.85c, Pittsburgh, are specifying most of this material out. New bookings have not been heavy in the past few days for this reason. Although 1.90c, Pittsburgh, is asked on small lots a 1.85c price is still available for second quarter on moderate and large sized business.

CONTRACTS PLACED

4775 tons, instead of 4750 tons as noted March 8, 41 barges, Mississippi River commission, Vicksburg, Miss., to American Bridge Co.

2000 tons, penstock, Seattle, to Puget Sound Machinery depot.

1550 tons, Cedar river pipe lines, Seattle, to Puget Sound Machinery depot.

1000 tons, ten locomotive boilers for Great Northern railroad, to Puget Sound Machinery depot.

1000 tons, pipe line, Tacoma, Wash., to Bethlehem Steel Co. General contract to Birchfield Boiler Works, Tacoma.

750 tons, three digesters for Grays Harbor Pulp Mill, Washtington, to Puget Sound Machinery depot.

600 tons, kilns for Pacific Coast Cement Co., Seattle, to Traylor Engineering Co.

425 tons, steamer IROQUOIS remodeling, to Barde Steel Co. General contract to Lake Washington shipyards.

200 tons, two 100 x 26 x 6½-foot barges for the United Gas Improvement Contracting Corp. to be used in construction of a bridge at Vicksburg, Miss., to Dravo Contracting Co.

100 tons, one steel hull for Mississippi River commission, Memphis, Tenn., to Riter-Conley Co.

100 tons, one steel tug for the United States Engineers, Galveston, Tex., to Charles Ward Engineering Co., Charleston, W. Va.

CONTRACTS PENDING

4830 tons, Wildcat aqueduct, East Bay Municipal utility district, Oakland, Calif.; bids in April 20.

3668 tons, Sequoia aqueduct, East Bay Municipal utility district, Oakland, Calif; bids April 20.

3000 to 5000 tons, gas holders, New York state.

445 tons, siphons for Kittitas canal project, Yakima, Wash.; bids in April 10 by United States bureau of reclamation at Denver.

350 tons, 12 composite wood and steel barges for Mississippi River commission, Vicksburg, Miss.; bids close March 22.

Semifinished

Booking Contracts for Second Quarter at Present Prices—Specifications Are Heavy

MAKERS of sheet bars, billets and slabs are negotiating with consumers for second quarter contracts. While some interests are asking $1 a ton more than present quotations, others are taking business at these levels, especially where customers want to cover requirements three months ahead. Specifications are heavy, some mills having backlogs sufficient to operate at capacity.

SEMIFINISHED STEEL PRICES, PAGE 764

Pittsburgh, March 20.—Semifinished steel is quiet, although specifications are good. Various steel companies have renewed arrangements for second quarter requirements. Billet sellers, while talking about the desirability of an advance from $33 have accepted orders until July 1 at that figure, and on some small billets have succeeded in getting the full $1 differential. Sheet bars are $34. Some second quarter contracts have been booked on wire rods at $44, but no specifications have been received, most buyers being well equipped with stocks accumulated at lower figures. Forging billets are quiet at $38 and $39, most users being covered for the entire second quarter. Specifications still are slow from the oil well tool makers. Skelp is inactive at 1.85c to 1.90c.

Philadelphia, March 20.—Several small lots of billets have been sold at $33, Pittsburgh. Rerollers have been sold at $38. There is some talk of an advance on forging billets but no action yet.

Chicago, March 20.—Semifinished steel buying is active. Specifications on contracts are fully up to the average for the quarter. Specifications for wire rods are active. Wire rods hold at $45, Chicago. Sheet bar specifications have been heavy the past three to four weeks. The price is steady at $35, Chicago.

Youngstown, O., March 20.—Readjustment of the Empire Steel Corp. mills at Niles, O., to their new regime is making some shifts in the outlet for sheet bars in the valley trade. Sales now are at a miniumum but are expected to pick up for second quarter. Sheet bars bring $34 and billets and slabs $33, Youngstown, and Pittsburgh.

Cleveland, March 20.—Second quarter reservations of semifinished steel are being made by leading merchant producers. Prices have not been fully established for that period, for while a few companies have contracted at present prices, others are trying to obtain more. Specifications continue heavy. The Corrigan, McKinney Steel Co. is operating 13 of its 14 open hearths.

Iron and Steel Scrap Prices

Corrected to Tuesday noon. Delivered to Consumers.

Steel Works Scrap

HEAVY MELTING STEEL

Birmingham	10.75 to 11.00
Boston (dealers)	9.00 to 9.10
Buffalo, No. 1	14.50 to 15.00
Buffalo, No. 2	13.00 to 13.50
Chicago	12.75 to 13.25
Cincinnati (dealers)	11.00 to 11.50
Cleveland, No. 1	13.75 to 14.00
Cleveland, No. 2	13.25 to 13.50
Detroit, No. 1	11.00 to 11.50
Eastern Pennsylvania	13.50 to 14.00
Eastern Pennsylvania, No. 2	11.00 to 11.50
Bethlehem delivery	13.50 to 14.00
New York (dealers)(railroad)	10.00 to 10.85
New York (dealers) (yard)	7.00 to 7.50
Pittsburgh, No. 1	14.25 to 14.50
St. Louis	11.50 to 12.00
Valleys, No. 1	14.50 to 15.00

COMPRESSED SHEETS

Buffalo	12.75 to 13.25
Chicago	11.25 to 11.75
Cleveland	12.50 to 13.00
Detroit	10.00 to 10.50
Pittsburgh	14.00 to 14.25
Valleys	14.00 to 14.50

BUNDLED SHEETS

Buffalo	10.00 to 10.50
Cincinnati (dealers)	9.50 to 10.00
Cleveland	11.50 to 12.00
Eastern Pennsylvania	10.50
Pittsburgh	13.00 to 13.25
St. Louis	7.75 to 8.25

SHEET CLIPPINGS, LOOSE

Chicago	8.25 to 8.75
Cincinnati	8.75 to 9.25
Detroit	7.00 to 7.50
St. Louis	7.50 to 8.00

STEEL RAILS, SHORT

Birmingham	11.50 to 12.00
Buffalo	15.50 to 16.00
Chicago	15.25 to 15.75
Cincinnati (dealers)	16.00 to 16.50
Detroit	11.00 to 11.50
St. Louis	15.50 to 16.00

STOVE PLATE

Birmingham	13.00 to 14.00
Boston (consumers)	9.50 to 10.50
Buffalo	12.75 to 13.25
Chicago (net)	12.00 to 12.50
Cincinnati (dealers) net	8.50 to 9.00
Cleveland	12.00 to 12.50
Detroit (net tons)	10.50 to 11.00
Eastern Pennsylvania	12.00 to 12.50
New York (dealers) (mill)	8.25 to 8.50
Pittsburgh	12.50 to 12.75
St. Louis	13.00 to 13.50

LOW PHOSPHORUS

Buffalo, billet and bloom crops	16.75 to 17.25
Cincinnati (dealers)	13.00 to 13.50
Eastern Pennsylvania	17.50 to 18.50
Pitts. billet and bloom crops	18.00 to 18.50
Cleveland, billet, bloom crops	17.00 to 17.50

SHOVELING STEEL

Chicago	12.75 to 13.25
Pittsburgh	10.50 to 11.00
St. Louis	11.50 to 12.00

KNUCKLES, COUPLERS, SPRINGS

Buffalo	15.50 to 16.00
Chicago	14.25 to 14.75
Eastern Pennsylvania	16.50 to 17.00
Pittsburgh	16.00 to 16.50
St. Louis	12.50 to 13.00

FROGS, SWITCHES, GUARDS

Chicago	13.50 to 14.00
St. Louis	13.00 to 13.50

ANGLE BARS—STEEL

Buffalo	14.50 to 15.00
Chicago	14.25 to 14.75
St. Louis	11.50 to 12.00

Iron Mill Scrap

RAILROAD WROUGHT

Birmingham	11.00 to 12.00
Boston (dealers)	10.00 to 10.50
Buffalo, No. 1	12.25 to 12.75
Buffalo, No. 2	14.25 to 14.75
Chicago, No. 1	12.30 to 12.90
Chicago, No. 2	12.75 to 13.25
Cincinnati, No. 1 (dealers)	10.50 to 11.00
Eastern Pennsylvania	15.00 to 15.50
New York, No. 1 (dealers)	11.00 to 11.50
Pittsburgh, No. 1	11.00 to 11.50
Pittsburgh, No. 2	14.25 to 14.50
St. Louis, No. 1	9.75 to 10.25
St. Louis, No. 2	11.50 to 12.00

WROUGHT PIPE

Boston (dealers)	7.75 to 8.25
Eastern Pennsylvania	13.00
Buffalo	12.00 to 12.50
New York (dealers)	8.00 to 8.50

YARD WROUGHT

Boston	8.00 to 8.50
Eastern Pennsylvania	14.50 to 15.00

BUSHELING

Buffalo	12.75 to 13.25
Chicago, No. 1	10.50 to 11.00
Chicago, No. 2	8.50 to 9.00
Cincinnati, No. 1 (dealers)	10.50 to 11.00
Cincinnati, No. 2	6.50 to 7.00
Cleveland, No. 2	10.00 to 10.25
Pittsburgh, No. 1	12.00 to 12.50
St. Louis, No. 1	9.75 to 10.25
Detroit, mixed	7.25 to 7.50

MACHINE SHOP TURNINGS

Birmingham	8.00 to 9.00
Boston	5.50 to 6.00
Buffalo	9.25 to 9.75
Chicago	8.00 to 8.50
Cincinnati (dealers)	7.50 to 8.00
Cleveland	8.00 to 8.25
Detroit	6.25 to 6.50
Eastern Pennsylvania	10.00 to 10.50
New York (dealers)	7.00 to 7.50
Pittsburgh	10.00 to 10.50
St. Louis	7.00 to 7.50

CAST IRON BORINGS

Birmingham (chemical)	13.00 to 13.50
Birmingham (plain)	8.00 to 9.00
Boston (chemical)	9.50 to 10.00
Boston (dealers)	6.00 to 6.50
Buffalo	9.75 to 10.25
Chicago	9.50 to 10.00
Cincinnati (dealers)	8.25 to 8.75
Cleveland	10.00 to 10.25
Detroit	7.00 to 7.50
Eastern Pennsylvania	11.00
Eastern Pennsylvania (chem.)	14.50 to 15.00
New York (dealers)	6.75 to 7.35
Pittsburgh	10.50 to 11.00
St. Louis	9.00 to 9.50
Valleys	13.50

MIXED BORINGS AND TURNINGS

For blast furnace use

Boston (dealers)	5.75 to 6.25
Buffalo	9.50 to 10.00
Cincinnati (dealers)	8.25 to 8.75
Cleveland	10.00 to 10.25
Detroit	7.00 to 7.50
Eastern Pennsylvania	10.50 to 11.00
New York (dealers)	6.75 to 7.35
Pittsburgh	10.50 to 11.00

PIPES AND FLUES

Chicago (net)	8.50 to 9.00
Cincinnati (dealers)	7.75 to 8.25
St. Louis	9.50 to 10.00

RAILROAD GRATE BARS

Buffalo	11.00 to 11.50
Chicago (net)	11.75 to 12.25
Cleveland	12.00 to 12.50
Eastern Pennsylvania	12.00 to 12.50
New York (dealers)	8.00 to 8.50
St. Louis	11.50 to 12.00

FORGE FLASHINGS

Boston (dealers)	6.00 to 6.50
Buffalo	12.00 to 12.50
Chicago	9.50 to 10.00
Cleveland (over 10 in.)	12.50 to 13.00
Detroit	9.50 to 10.00
Pittsburgh	13.00 to 13.50

FORGE SCRAP

Boston (dealers)	6.00 to 6.50
Chicago	15.50 to 16.00
Eastern Pennsylvania	11.00

ARCH BARS AND TRANSOMS

Chicago (net)	18.50 to 19.00
St. Louis	19.50 to 20.00

Iron and Steel Works Scrap

AXLE TURNINGS

Boston (dealers)	6.75 to 7.00
Buffalo	12.50 to 13.00
Chicago	10.25 to 10.75
Cleveland	12.00 to 12.25
Eastern Pennsylvania	12.00 to 12.50
Pittsburgh	13.00 to 13.50
St. Louis	10.00 to 10.50

STEEL CAR AXLES

Birmingham	16.00 to 17.00
Boston (shipping point)	15.50 to 16.00
Buffalo	16.75 to 17.25
Chicago	17.65 to 18.20
Cleveland	16.00 to 16.50
Eastern Pennsylvania	21.00 to 22.00
Pittsburgh	18.00 to 18.50
St. Louis	18.50 to 19.00

SHAFTING

Boston (shipping point)	13.00 to 13.50
Chicago	17.35 to 17.90
Eastern Pennsylvania	17.50 to 18.00
New York (dealers)	14.00 to 14.50
St. Louis	16.50 to 17.00

Iron Foundry Scrap

CAR WHEELS

Birmingham, iron	14.00 to 15.00
Boston (consumers)	14.00 to 14.50
Buffalo, iron	13.25 to 13.75
Buffalo, steel	15.50 to 16.00
Chicago, iron	13.75 to 14.25
Chicago, rolled steel	15.00 to 15.50
Cincinnati	12.25 to 12.75
Eastern Pennsylvania	16.00 to 16.50
New York iron (dealers)	12.00
Pittsburgh, iron	14.25 to 15.00
Pittsburgh, steel	16.00 to 16.50
St. Louis, iron	13.50 to 14.00
St. Louis, steel	14.25 to 14.75

NO. 1 CAST SCRAP

Birmingham, cupola	14.00 to 14.50
Boston	14.00 to 14.50
Buffalo	14.50 to 15.00
Chicago, No. 1 machinery	15.65 to 16.25
Chicago, No. 1 railroad	14.30 to 14.85
Chicago, No. 1 agricultural	14.55 to 15.10
Cincinnati No. 1 machinery cupola (net tons dealers)	14.50 to 15.00
Cleveland, cupola	16.50 to 17.00
Detroit (net tons)	12.25 to 12.75
Eastern Pennsylvania (cupola)	16.50 to 17.00
New York, cupola (dealers)	13.50
Pittsburgh, cupola	14.50 to 15.00
San Francisco, delivered	20.00 to 21.00
Seattle	15.25 to 15.50
St. Louis, railroad	13.50 to 14.00
St. Louis, agricultural	13.50 to 14.00
St. Louis, machinery	14.00 to 14.50
Valleys	16.50 to 17.00

HEAVY CAST

Boston	10.50 to 11.00
Buffalo (breakable)	11.50 to 12.00
Cleveland (breakable)	12.25 to 12.50
Detroit (automobile)(net tons)	20.00 to 21.00
Detroit, machinery cast No. 1 (net)	12.25 to 12.75
Eastern Pennsylvania	15.50 to 16.00
New York (dealers)	11.75 to 12.00
Pittsburgh	12.50 to 13.00

MALLEABLE

Boston, railroad	13.00 to 13.50
Buffalo	15.00 to 15.50
Chicago, agricultural	11.75 to 12.25
Chicago, railroad	12.75 to 13.25
Cincinnati, railroad (dealers)	12.50 to 13.00
Cincinnati, agricultural (dealers)	12.25 to 12.75
Cleveland, agricultural	15.00 to 15.50
Cleveland, railroad	15.50 to 16.00
Detroit, auto	14.50 to 15.00
Pittsburgh, railroad	14.50 to 15.00
St. Louis, agricultural	11.50 to 12.00
St. Louis, railroad	11.50 to 12.00

Miscellaneous Scrap

RAILS FOR ROLLING

5 feet and over

Birmingham	13.50 to 14.00
Boston (dealers)	10.00 to 10.50
Buffalo	14.50 to 15.00
Chicago	14.25 to 14.75
Eastern Pennsylvania	15.25 to 15.50
New York	11.00 to 12.00
Pittsburgh district	16.50 to 17.00
St. Louis	13.75 to 14.25

LOCOMOTIVE TIRES

Chicago, No. 1	14.00 to 14.50
Chicago, cut	16.00 to 16.50
St. Louis, No. 1	12.25 to 12.75

LOW PHOSPHORUS PUNCHINGS

Chicago	14.00 to 14.50
Pittsburgh	16.00 to 16.50

Scrap

Weakness Develops in All Markets—Rate of Melt High—Heavy Supply Forms Burden

GENERAL weakness is evident in the iron and steel scrap market, with prices perceptibly lower in many instances. Heavy melt gives an element of strength which heavy supplies overcomes. At Chicago large users are regulating shipments on contract. Pittsburgh buyers of heavy melting steel are offered tonnages much under prices paid a week ago.

Chicago, March 20.—Iron and steel scrap is speculatively weaker, but the high rate of consumption is keeping prices fundamentally strong. Railroad offerings of heavy melting steel have been heavy, but consumers probably never have been using melting steel at a faster rate. The fact that two large consumers still are regulating shipments has had a tendency to weaken melting steel grades. Considerable dealer trading in melting steel is at $12.75. The last price paid by a consumer was $13.25, shipments now being made on that order.

Boston, March 20.—Conditions in the scrap market have become spotty. With the exception of machine shop turnings, which are lower, prices hold practically steady, although tending to weakness. Machine shop turnings are at $5.50 to $6 at car shipping points.

New York, March 20.—Iron and steel scrap is marking time, with little change in price, although the tone is easy. Virtually all trading is against contracts. Some fresh consuming demand is offered by a couple of mills at 25 and 50 cents under what they recently paid, but no business has been placed at these figures.

Philadelphia, March 20.—Scattered buying is the only activity in iron and steel scrap and prices are weaker.

Buffalo, March 20.—Lack of new tonnage business has prevailed for the past ten days, as far as heavy melting steel is concerned. Shipments to steelworks indicate consumption of scrap is large and the approaching expiration of some large contracts indicate new buying may be expected in April.

Pittsburgh, March 20.—Scrap has lost some of the strength of a week ago when a nearby mill took at least 5000 tons of heavy melting steel at $14.75. Tonnage now is offered it at $14.50, but this is refused. Dealers are able to buy at Vandergrift and other nearby consuming points at $14.50 and some have paid $14.25 for certain destinations. While one is willing to pay $15 for an Ohio river point for prompt shipment, the material must be A-1 railroad steel, so that is hardly a criterion. This leaves ordinary heavy melting steel quotable at $14.25 to $14.50. Low phosphorus punchings are down 50 cents to $16 to $16.50.

Cleveland, March 20.—Indifference continues to characterize the iron and steel scrap market in the Cleveland district and in the valley. Mills are regulating shipments closely, and the supply is ample. Blast furnace grades fail to show strength, cast iron borings and No. 2 busheling not bringing more than $10.25 as the top figure. No. 1 heavy melting steel is quoted at $13.75 to $14 in Cleveland and $14.50 to $15 in the valley. Prices are unchanged but only nominal in many instances.

Cincinnati, March 20.—The scrap market continues ragged and unsatisfactory. Railroad offerings closed last week, considering conditions since the first of the year, brought good prices. Prices are again softening, heavy melting steel being reduced 25 cents to $11 to $11.50; railroad wrought 25 cents down to $10.50 to $11; machine shop turnings and cast iron borings, reduced 50 cents each; and car wheels down 25 cents.

St. Louis, March 20.—Iron and steel scrap continues quiet, with the trend of prices still downward. Mills, while operating at an active rate, claim to be well supplied with scrap, some having ample to see them comfortably through second quarter. Similar conditions exist among foundries and other melters, and trading is confined chiefly to dealers. Additional cuts have been made in some important items, and generally the market is weak. Many quotations in dealers' lists are purely nominal, there being no actual transactions upon which to predicate exact values. Steel car axles were lowered $1 per ton to a minimum of $18.50. Arch bars and transoms dropped to $19.50 and frogs, switches and guards to $13.

Birmingham, Ala., March 20.—Continued activity is noted and indications point to a firmer market shortly. Heavy melting steel holds at $10.75 minimum, while other quotations are unchanged.

Reparation Is Fixed

Washington, March 20.—Upon further hearing, the amount of reparation has been determined on certain shipments of iron and steel articles from Pittsburgh and points in the Pittsburgh district to Erie, Pa., based upon the rate found reasonable in the original report, says the interstate commerce commission in a decision in the case of the Erie Bolt & Nut Co. against the Baltimore & Ohio railroad.

Sheets

Prices Show Weakness as Test of Market Approaches—Some Mills Accumulating Backlogs

AS SHEETS approach the time for a test on tonnage buying prices of some grades are showing a tendency to weaken. Black sheets are being shaded $2 to $3 a ton, while galvanized are more generally quoted at 3.65c to 3.75c, and blue annealed 2.00c to 2.10c, base, Pittsburgh. Demand for autobody sheets has not been sufficient to afford a full test of the market.

SHEET PRICES, PAGE 764

Pittsburgh, March 20.—Specifications last week were the best in two years for some sheetmakers. Shipping rates were high. Bookings from automotive and allied users were heavy all week, as were specifications from agricultural implement makers and other large users. American Sheet & Tin Plate Co. starts the week with a four-point gain in operating schedules, going to 86 per cent. Many independents are 85 to 90 per cent. Additional second quarter contracts have been written, and included are some automobile companies who have paid 4.15c for full finished. Manufacturers here are more successful in obtaining full schedule for second quarter than in some other sections. Here 2.10c applies on blue annealed and 2.90c on black. Some have quoted 3.75c on galvanized, but have lost the business. In some other sections, black and blue annealed have been sold at a lower figure, or mill basis, by $2 per ton. Sheets used in building construction remain among the wanted grades, and the electrical sheet movement likewise remains high.

New York, March 20.—Specifications for sheets on first quarter contracts continue good. Second quarter contracting is expected to materialize within the next week or 10 days. In the meantime the market is showing continued firmness. Blue annealed and galvanized especially are firm, the former at 2.10c, base, Pittsburgh, and the latter at 3.75c. It is only in black sheets that shading is reported, and this is less pronounced recently. Black sheets are 2.80c to 2.90c, base, Pittsburgh.

Buffalo, March 20.—Demand for automobile sheets continues brisk.

Specifications on contracts are heavy, and Buffalo sheet mills are operating at the highest rate of the year to keep shipments up to specifications. Autobody is 4.15c, base, Pittsburgh, while black sheets are 2.90c.

Chicago, March 20.—Second quarter contracting for sheets has progressed so satisfactorily that probably half of the tonnage for that period is obligated. Mill operations are above 75 per cent. Specifications are slightly above February. Shipments have become slightly easier and now are three to four weeks deferred. Little resistance is reported to prices. Chicago delivered quotations are holding at 3.05c for No. 24 black, 3.90c for No. 24 galvanized, and 2.25c to 2.35c for No. 10 blue annealed.

St. Louis, March 20.—Producers and distributors of sheets report continued satisfactory conditions, and in some instances improvement over recent weeks. Specifications from automobile builders and car manufacturers are good. The leading local producer is operating its sheet mills at capacity. Prices are firm.

Youngstown, O., March 20.—The rate of independent sheet mill operation continues satisfactory, due to specifications from consumers. One hundred fourteen units are active out of 127. Makers of full-finished sheets have backlogs for two weeks, but others are not so well fixed. Quotations are 2.90c, Pittsburgh, for common black, 3.75c for galvanized, 2.10c to 2.20c for blue annealed, and 4.15c for autobody. Test of these prices may show some weakness.

Philadelphia, March 20.—Negotiations are now under way for sheet contracting in this district for second quarter but it is too early to determine whether prices will hold. Blue annealed contracts generally had been made at 2.10c, Pittsburgh, with some business at 2.15c.

Cleveland, March 20.—Entrance of two low price automobile builders in the Detroit district into the sheet market in the next week is expected to offer a test to autobody quotations, which have been holding at 4.15c, Pittsburgh, for the small amount of business being placed. Black sheets at 2.90c, Pittsburgh, seem firm here, although evidence of sales on a mill base by valley makers lends a weakening aspect to the situation. Blue annealed is 2.10c, Pittsburgh, with several orders of over 100 tons each going at that figure. Little galvanized is being placed, with the price 3.75c, Pittsburgh.

The sectional committee on scientific and engineering symbols and abbreviations, consisting of 30 members representing 37 national organizations, has announced proposed standards on "Symbols for Hydraulics." These symbols were prepared by subcommittee No. 2 of which G. E. Russell, professor of theoretical hydraulics, Massachusetts Institute of Technology, is chairman. Criticisms and comments should be addressed to Preston S. Millar, secretary of the sectional committee, Eightieth street and East End avenue, New York.

Tin Plate

Specifications Fair—Operating Rate Is Increasing

TIN PLATE PRICES, PAGE 764

Pittsburgh, March 20.—Tin plate specifications are fairly active from makers of general line and packers' cans. General buying by purchasers in diversified lines who do not contract is of fair proportions. American Sheet & Tin Plate Co. is increasing operating schedules and now is at 86 per cent. McKeesport Tin Plate Co. is operating full, as is Jones & Laughlin Steel Corp., and other makers. The price is unchanged at $5.25.

Youngstown, O., March 20.—More tin plate mills in the Shenango valley portion of the district are being put to work this week, and also the New Philadelphia mills of the American Sheet & Tin Plate Co. Specifications continue fairly satisfactory. Some mills are discussing the necessity of cutting down unspecified first quarter tonnages on April 1. Quotations for carloads hold at $5.25 per base box, Pittsburgh.

February Coke Total Off

February output of by-product coke was 3,708,000 net tons and of beehive 390,000 tons, making a total of 4,098,000 tons, according to the federal bureau of mines. This was a decline from the January total of 3,880,000 tons of by-product coke and 376,000 tons of beehive coke. In February by-product coke ovens consumed 5,328,000 tons of coal and beehive ovens 615,000 tons.

Noblitt-Sparks Industries Inc. is the new name of the Indianapolis Pump & Tube Co., Indianapolis, manufacturer of heaters, tire pumps, etc.

Pipe

Line Pipe Projects Still Under Negotiation—Cast Prices Strengthen Except in East

MOST pipe projects, especially gas lines, are under negotiation, although a 154-mile line in the Southwest has been placed. Los Angeles is taking bids on 17,440 tons and 13,250 tons of 50 to 60-inch sizes. Pending cast pipe includes 3200 tons at Chicago, 2000 at Detroit and 5355 at New York. Prices are stronger at $30, Birmingham, except in the East.

PIPE PRICES, PAGE 764 AND 799

Pittsburgh, March 20.—While projected gas lines still stir up considerable interest among pipemakers, nothing is heard here regarding the placing of the large tonnages involved. Surveys are not yet completed for several, but early action is expected on others.

Buttweld pipe business is showing slight improvement and this probably will be the case for some weeks as jobbers succeed in disposing of their accumulated stocks. Lapweld pipe still is quiet because of the poor showing being made by the oil industry. Pipe mills are operating around 50 per cent of capacity. Prices of tubular products, especially seamless steel, evidence keen competition.

An order for 154 miles of line pipe in 3 to 10-inch sizes, has been placed by the West Texas Gas Co., subsidiary of the Prairie Oil & Gas Co., the tonnage being split between a Pittsburgh district and eastern mill.

New York, March 20.—On the great bulk of 5355 tons of cast pipe inquired for recently by the local department of water supply, gas and electricity, bids were unquestionably the lowest submitted on a city pipe job in considerable time. R. D. Wood & Co. were low on 1830 tons of 12-inch at $35.25, delivered city yards; on 1640 tons of 8-inch at $34.88 and on another and exactly similar tonnage at $36.25.

Allowing $9.25 for freight and $1.50 for handling and stacking, it is evident that low bidder on the bulk of the tonnage submitted a price equivalent to less than $24.75, Birmingham. This bidder, the Wood company, was also successful bidder on the city tonnage let several weeks ago. Indicative of the extent of decline in cast pipe here the past year is the price of $50.25 bid on a 1600-ton city job, March 11, 1927. It was about that time that the softening in cast pipe prices first became pronounced.

Chicago, March 20.—Bids will be received next week by the Chicago city engineer for 3200 tons of 24 to 48-inch cast iron water pipe, and also about 200 tons of fittings. Detroit waterworks department will receive bids shortly for 2000 tons of 16-inch pipe. Springfield, Ill., opened bids yesterday for 380 tons of 24-inch. James B. Clow & Sons have been awarded 1000 tons of 4 to 12-inch pipe for Barberton, O. The outlook for cast iron pipe business has shown improvement. Contract business continues active at 8000 to 10,000 tons weekly. Nothing under $30, base, Birmingham, has been reported recently by sellers for 6 to 24-inch contract business.

Birmingham, Ala., March 20.—Advance in price and increased business were features of the cast iron pipe trade during the week. Pressure pipe output is steady, one of the active producers operating around 80 per

cent. Pressure pipe quotations are now on a base of $30 to $31 for 6-inch and over sizes.

Seattle, March 20.—About 510 tons of steel pipe is involved in the water system expansion for Brighouse, B. C. Four miles of 6-inch or 200 tons and 310 tons of 4-inch seamless steel pipe, valves, connections, etc., will be required. Forty tons of 4-inch and 32 tons of 6-inch will be needed for the water supply system of Oak Harbor, Wash.

CONTRACTS PLACED

3096 tons, 4 to 12-inch class B, Southgate, Calif., to Leo Vuksich.
1000 tons, 4 to 12-inch pipe for Barberton, O., to James B. Clow & Sons.
400 tons, principally 20-inch pipe, Washington, to Glamorgan Pipe Co., Lynchburg, Va., at a bid of around $29.50, Birmingham.
271 tons, 2 to 10-inch class C, improvement to Twenty-eighth street San Diego, Calif., to unnamed interest.
250 tons, 12-inch pipe, Yonkers, N. Y., to R. D. Wood & Co. on a bid of $37.50, delivered; Donaldson Iron Co. second low at $38.50, delivered.
150 tons, 6 to 12-inch pipe for Springfield, Mass., to United States Cast Iron Pipe & Foundry Co.
110 tons, 4 to 8-inch class B, improvement to Whitman street, San Diego, Calif., to unnamed interest.

CONTRACTS PENDING

17,440 tons, 50 and 56-inch class C, Wildcat aqueduct, East Bay municipal untility district, Oakland, Calif; bids April 20.
13,250 tons, 50, 56 and 60-inch class C, Sequoia aqueduct, East Bay municipal utility district, Oakland, Calif.; bids in April 20.
5355 tons, cast pipe for department of water supply, gas and electricity, New York; R. D. Wood & Co. low on 5110 tons of 8 to 12-inch and United States Cast Iron Pipe & Foundry Co. low on 245 tons of 6-inch.
3200 tons, 24 to 48-inch pipe for Chicago; bids March 27. Also 200 tons of fittings in separate bids.
2000 tons, 16-inch pipe for Detroit; date of bids later.
2000 tons, 4 to 24-inch cast pipe, New York; bids opened March 19.
1500 tons, City of Cincinnati.
978 tons, 540 tons of 2-inch and 438 tons of 30-inch class C pipe, Milwaukee; bids in March 26.
663 tons, 6 to 20-inch class B and C, Santa Barbara, Calif.; bids rejected and new bids asked for March 22.
600 tons, 6, 8 and 12-inch for water district of Broadalbin, N. Y.; R. D. Wood & Co. low on class B.
380 tons, 24-inch pipe for Springfield, Ill.; bids in.
222 tons, 4 to 8-inch class B, Armona, Calif., went steel pipe.
188 tons, 6 and 8-inch class A and B, municipal improvement district No. 3, Monrovia, Calif., went lapweld pipe.
114 tons, 6 to 10-inch class B, Red Bluff, Calif.; bids in March 29.
110 tons, 16-inch, class A, bell and spigot pipe for High Point, N. C.; bids in by W. A. Davis, mayor, March 28.
Unstated tonnage, 25 miles for main extensions, Providence Gas Co., Providence, R. I.
Unstated tonnage, 8255 feet 6-inch and 125 feet 4-inch class C pipe, Marshfield, Wis.; bids in March 30.
Unstated tonnage, 3965 feet 8-inch, 600 feet, 10-inch and 1850 feet of 12-inch pipe for Pineville, La.; bids in by J. M. Rembert, mayor.
Unstated tonnage, 1000 feet 4-inch, 17,000 feet 6-inch, 3000 feet 8-inch and 600 feet 10-inch class C pipe, Oshkosh, Wis.
Unstated tonnage, 3800 feet 6-inch class C pipe, Racine, Wis.; bids in March 20.

Bars

Users Specify Fully on Lower-Priced Contracts—Mills Have Heavy Order Books

EFFORT to specify all first quarter bar tonnage to take advantage of lower prices is bringing to producers a heavy backlog of orders. This is limiting second quarter buying somewhat. Asking prices are firm in all mill centers and some contracting is being done at the new levels. Rail steel bars are in demand at steady prices.

BAR PRICES, PAGE 764

Chicago, March 20.—Orders are being closed for second quarter bar products, as well as plates and shapes, by consumers having actual orders at hand for their fabricated products. These sales are at 2.00c, Chicago. Buyers who normally anticipate finished steel requirements are much less active in contracting, indicating that practically no speculative feeling exists. Shipments of bar products by all makers are ahead of the daily average of last month. This was another heavy week in specifications, orders passed to mills ranking third or fourth in weekly specifications of the past 12 weeks. Sales fell off slightly from the high rate of a week ago. The automotive outlook is particularly bright. As a whole the farm implement trade has indicated no decline in specifications.

Rail steel bar mills are getting orders for fence posts for spring delivery. General manufacturing lines are active. Both Chicago Heights mills are operating full double turn. The price for second quarter is 1.85c, Chicago Heights. Bar iron is steady at 2.00c.

Soft steel bars are quoted generally at 2.00c. Sales of less than 100 tons are reported fairly numerous at 2.10c. It is evident that specifications on 1.90c and 1.95c contracts will be to the full limit. Some of the latter contracts expired at the end of February, one maker reports.

New York, March 20.—One large maker of steel bars reports specifications so far in March nearly as large as for all February. Indications are the specification rate will increase since the prices at which first quarter contracts were booked will expire March 31. These contracts were at 1.75c and 1.80c, base, Pittsburgh. Second quarter contracts generally are on the basis of 1.85c. The 1.85c, base, Pittsburgh, price now seems to have disappeared. Mills generally gave customers a chance to close at 1.85c for second quarter and now 1.90c appears to be firm.

Pittsburgh, March 20.—Merchant steel bar specifications continue to show increase. This is due to specifications against low-priced contracts expiring March 31. Specifications against 1.85c contracts for second quarter may be delayed. At present 1.90c applies to small lots in the spot market. Some buyers of 100 tons at a time are holding out for 1.85c.

Refined iron bar demands are spasmodic. Small lots continue to be taken as needed. Prices appear to be fairly steady, starting at 2.75c.

Cleveland, March 20.—Soft steel bar bookings, considering all makers, are slightly ahead of the comparable period of February and approximate a year ago. Automotive interests are the market leaders. For this reason good bar business may extend well into the next quarter. Moderate and large sized buyers can still do 1.85c, Pittsburgh, for second quarter although 1.90c is asked on small lots.

Iron Ore

More Inquiries Developing for Lake Superior Iron Ore

IRON ORE PRICES, PAGE 795

Cleveland, March 20.—The market for Lake Superior iron ore is becoming active, but most of the business is being transacted between producers and their regular customers. Some consumers will need more ore this season than stipulated in their long-term contracts and are asking for prices. One such inquiry is for around 150,000 tons, but is not being circulated in the open market. Except the Ford Motor Co.'s inquiry, which has not yet been closed, all inquiries in the open market probably do not exceed 200,000 tons.

Ore consumption increased in February, and reserves on hand at furnaces and Lake Erie docks March 1 were 805,000 tons less than on March 1, 1927, as shown by the following report from the Lake Superior Iron Ore association:

	Tons
Ore consumed in January	4,303,132
Ore consumed in February	4,394,931
Increase in February	91,799
Ore consumed in February, 1927	4,233,863
Ore at furnaces March 1, 1928	23,015,392
Ore on Lake Erie docks March 1, 1928	5,987,408
Total at furnaces and Lake Erie docks March 1, 1928	29,002,800
Total March 1, 1927	29,808,532

The Corrigan, McKinney Steel Co. has augmented its mine reserves by acquiring the Tilden mine, on the Gogebic range, formerly operated by the United States Steel Corp.'s mining subsidiary. This mine gives the company a continuous stretch of two miles on the Gogebic range.

Structural Shapes

Inquiries and Prospective Work Indicate Heavy Spring Buying but Present Awards Slumped—Second Quarter Well Sold

SUFFICIENT structural steel inquiries are before the fabricators and mills to assure continued good operations provided closing action is not delayed too long. Leading inquiries this week were 7700 tons of subway work in Brooklyn, N. Y. Chicago & North Western railroad has increased its 1928 bridgework inquiry from 6000 to 9000 tons. Chicago's active pending list totals 15,000 tons. Another unit of the French development in New York will require 7000 tons.

Plain material contracting for second quarter has been well under way at 1.85c, Pittsburgh, and 2.00c, Chicago. Fabricated and erected quotations continue to suffer from local and outside competition, with a wide range of prices resulting from bids on attractive work.

STRUCTURAL SHAPE PRICES, PAGE 764

New York, March 20.—Notwithstanding substantial work under contemplation, current demand for structural steel tends toward sluggishness. Both inquiries and orders are scattered, with few heavy tonnages. The largest inquiry this week calls for 7700 tons for subway work in Brooklyn, bids to be opened March 30. Bridgework is featured by 3000 tons for state highway spans at Wilmington, N. C. Weakness continues in fabricated material, and while shapes still may be quoted at 2.14c to 2.19c, New York, on the general run of business, the market is weak at that range, the inside being more representative.

Boston, March 20.—The structural market has changed little in the past week. Two fairly good awards were made, consisting of 1600 tons for a power house at New Haven, Conn., and 600 tons for power house extensions at South Weymouth, Mass.

Philadelphia, March 20.—Structural shape demand is dull, and eastern mills now are operating 60 to 70 per cent. Numerous contracts were signed in the past week for second quarter at 2.00c, Bethlehem, equivalent to 2.13c, delivered Philadelphia. While some consumers in this district contracted at 1.85c, Pittsburgh, in some cases larger consumers have been able to obtain an extension of lower prices.

Pittsburgh, March 20.—Structural shape awards are growing smaller individually. One important fabricator here received only 250 tons last week, and the largest single job required 65 tons. Plain material contracts for first quarter at 1.80c and less are being closed out, making room for specifications against 1.85c arrangements, customers having been covered until July 1 at that figure. The 1.90c quotation applies on the spot market.

Cleveland, March 20.—Specifications for plain structural material in the past week have been heavier, as fabricators and other consumers sent in releases to take all tonnage covered at low prices. On new contracts and spot business, 1.85c to 1.90c, Pittsburgh, is firm. Fabricated and erected quotations seem to be tending upward, more strength being noted on a few recent small jobs.

Chicago, March 20.—About 15,000 tons of structural steel awards is in the active stage in the immediate Chicago district. Fresh inquiry this week totals about 2500 tons, the smallest in the past three months. The building outlook continues good, awards in February having been almost double last February. Sales are reported at 2.00c, Chicago, for second quarter, while specifications for plain material are among the heaviest since Jan. 1.

Awards Compared

	Tons
Awards this week	**19,350**
Awards last week	**52,690**
Awards two weeks ago	**30,688**
Awards this week in 1927	**19,372**
Average weekly awards, Feb	**55,475**
Average weekly awards, 1928	**47,099**
Total awards to date, 1927	**444,335**
Total awards to date, 1928	**518,091**

CONTRACTS PLACED

5000 tons, Palmolive-Peet Co., Chicago, to American Bridge Co.

2200 tons, plant for Celanese Corp., Cumberland, Md., to McClintic-Marshall Co. Previously announced as unidentified buildings and as requiring 800 tons.

1600 tons, power house for United Illuminating Co., New Haven, Conn., to Levering & Garrigues Co.

1500 tons, county portion of Milwaukee safety building, Milwaukee, to Lakeside Bridge & Steel Co.

1000 tons, loft, 347 West Thirty-ninth street, New York, to Levering & Garrigues Co.

1000 tons, Proctors theater, Third avenue and Fifty-eighth street, New York, to Harris Structural Steel Co.

1000 tons, bridge across Kanawha river, Kanawha, W. Va., to McClintic-Marshall Co.

900 tons, approach to LaSalle street bridge, Chicago, to Ralph H. Simpson Co., 130 West Austin avenue, Chicago, steel to be fabricated by several companies.

800 tons, Howland store, Bridgeport, Conn., to Shoemaker Bridge Co.

700 tons, LaSalle college, Philadelphia, to Bethlehem Fabricators Inc.

680 tons, armory, Wilkes-Barre, Pa., to Bethlehem Construction Co.

650 tons, power house addition, Comal, Tex., to Virginia Bridge & Iron Co.

600 tons, power house for Edison Illuminating Co., South Weymouth, Mass., to New England Structural Co.

600 tons, municipal building, East Orange, N. J., to Alfred Smith & Sons.

505 tons, Grennan's Bakery at Pittsburgh, to McClintic-Marshall Co.

500 tons, highway bridge for state of New York, to American Bridge Co.

415 tons, including building for Youngstown Sheet & Tube Co., Youngstown, O., 350 tons, and Emory Methodist Episcopal church, Pittsburgh, 65 tons, to Pittsburgh-Des Moines Steel Co.

370 tons, plant for E. H. Edwards Wire Co., South San Francisco, Calif., to Pacific Coast Engineering Co.

200 tons, Elk's club, New York, to McClintic-Marshall Co.

200 tons, Convent of Good Shepherd, Los Angeles, to Llewellyn Iron Works.

200 tons, theater, Seventeenth street, Oakland, Calif., to Pacific Coast Engineering Co.

190 tons, building on Staten Island, New York, to Austin Co.

150 tons, Birmingport, Ala., Warrior river, warehouse for Inland Waterways Corp., to Virginia Bridge & Iron Co.

150 tons, apartment, Fourteenth and Dolores streets, San Francisco, to Judson-Pacific Co.

125 tons, two highway bridges, Michigan, to Massillon Bridge & Structural Co.

115 tons, miscellaneous work, mostly for Central Alloy Steel Corp., Massillon, O., to Massillon Bridge & Structural Co.

100 tons, bridge over Colorado river, Grand Canyon, Colo., to Llewellyn Iron Works.

100 tons, Pennsylvania railroad bridge, Winslow Junction, N. J., to Shoemaker Bridge Co.

Unstated tonnage, small bridge, Worcester, Mass., to Eastern Bridge Co.

CONTRACTS PENDING

15,000 tons, bridge across Ohio river, Louisville, Ky.; again up for negotiation.

9000 tons, bridgework for Chicago & North Western railroad, originally reported as 6000 tons.

7700 tons, section of Fourth avenue subway, Brooklyn, N. Y.; bids to be opened March 30.

7000 tons, unit nine, Fred F. French, Tudor City development, First avenue and Forty-first street, New York; specifications expected out shortly.

4000 tons, Capwell store, Oakland, Calif.; bids opened.

3500 tons, Austin senior high school, Chicago; American Bridge Co. low bidder.

3000 tons, state highway bridge, Wilmington, N. C.

3000 tons, Coyote Point bridge, San Francisco; award next week.

3000 tons, building for R. J. Reynolds Tobacco Co., Winston-Salem, N. C.; plans being refigured.

1580 tons, Milwaukee county section, public safety buildin, Milwaukee; Lakeside Bridge & Steel Co., low on material fabricated and delivered, at $96,440 and Worden-Allen Co. low on erection at $23,838.

1500 tons, Medical arts building, Minneapolis; awaiting financing.

1000 tons, three hangars for United States government, Hampton Roads, San Diego, and Panama; bids being taken.

1000 tons, Vardmont theater, New York; bids asked.

1000 tons, timber mill at Klamath Falls, Oreg.
800 tons, Allegheny county bridge, Coraopolis, Pa.; bids close this week.
700 tons, theater, Journal square, Jersey City, N. J.
700 tons, building for Columbia Mills, Inc., West Pullman, Ill.; plans revised.
600 tons, bridge over Smith river, Sacramento, Calif.; bids in April 4.
530 tons, bridge over Willamette river at Springfield, Wash.; bids in March 27.
500 tons, highway bridges for state of New York; bids asked.
450 tons, hotel, Geary street, San Francisco; bids being taken.
400 tons, addition to Medical-Dental building, San Francisco; bids in.
280 tons, bridge over Umpqua river, Kellogg, Oreg.; Clyde Catching general contractor.
250 tons, pier for Erie railroad, Hudson river, Jersey City, N. J.
250 tons, Allegheny county bridge, McKeesport-East Pittsburgh, Pa.; bids close March 21.
225 tons, theater, Sacramento, Calif.; bids in.
220 tons, bridge over McKenzie river near Coburg, Oreg.; bids March 27.
200 tons, Jewish synagogue, Squirrel Hill, Pittsburgh; bids in.
178 tons, bridge for Boston & Albany railroad, Brighton, Mass.
165 tons, apartment, Bay and Pols streets, San Francisco; bids being taken.
150 tons, bridge for Pennsylvania railroad; bids asked.
125 tons, William Hale Thompson pumping station, Chicago; Midland Structural Steel Co. low bidder.
110 tons, Deer Creek bridge, Hammerville, Pa.; general contract awarded Vang Construction Co.
100 tons, bridge over Chehalis river, Chehalis, Wash.; bids in March 26.
100 tons, state building, Ward's island, N. Y.
Unstated tonnage, lift span across government canal, Portage, Wis.; J. T. Henton, highway commissioner, Portage, bids in about April 15.
Unstated tonnage, 10-story loft building, 149th street and Park avenue, New York; DePace & Juster, architects.
Unstated tonnage, Rodin museum, Philadelphia.
Unstated tonnage, Chevrolet gear and axle plant at Detroit; bids in this week.

Jones & Laughlin Works Operates Safely

Pittsburgh, March 20.—The works of the Jones & Laughlin Steel Corp. on the north side of the Monongahela river have completed 60 days' operation without a single disabling accident to any employes. Approximately 1,000,000 man-hours have been worked since the last lost-time accident. These works include the Pittsburgh by-product coke plant, Eliza blast furnace department, Keystone structural fabricating department and the Soho department, made up of an open-hearth department, spike factory, chain works and three plate mills.

Enjoins Cut in Rates

An injunction prohibiting the Indiana public service commission from carrying into effect an order lowering the freight rate on wire rods between Kokomo and Crawfordsville, Ind., is asked in an action filed in superior court in Indianapolis by four railroads, the Monon, Big Four, Nickel Plate and Pennsylvania railroads. The ruling from which the railroads are appealing was made on petition of the Kokomo Steel & Wire Co., Kokomo.

The Jones & Laughlin Steel Corp., Pittsburgh, will shortly make its sixty-third shipment of steel products to southern points via the inland rivers. One barge will take sulphate of ammonia to Memphis, Tenn.

Concrete Bars

Better Weather Expected to Open Increased Roadbuilding Buying—Prices Are Firm

ALTHOUGH no marked improvement in general concrete bar buying is noted, some increased activity in roadbuilding is evident. Warmer weather in the Chicago district is stimulating spring construction. Buffalo district, hampered by snows, is resuming more nearly normal operations. Prices on concrete bars in most districts are firm.

REINFORCING BAR PRICES, PAGE 764

Chicago, March 20.—A number of building projects are becoming active with the advent of warmer weather. The outlook for reinforcing bar activity indicates spring building volume will be fully up to last year. Financing of apartment houses and apartment hotels continues in Chicago, this class of building taking reinforcing bars exclusively. Billet bar fabricators are about 50 per cent engaged. The largest job in some weeks was 1500 tons awarded for a cold storage building. Several large rail steel jobs are pending. Billet bar price is steady at 2.30c to 2.75c. Rail steel bars are firm at 1.85c to 1.95c.

Boston, March 20.—Small orders ranging from 15 to 50 tons continue the only demand in the reinforcing market. The proposed warehouse for the Boston & Maine railroad is so distant that estimates are not being figured.

Buffalo, March 20.—More than 1200 tons of new reinforcing bar and welded mesh tonnage is listed here this week, including a lot of 875 tons of the latter for county highway projects just approved. There is probably 3000 tons of pending inquiry altogether in western New York which will be covered soon. Sellers are quoting Buffalo delivery reinforcing bars from 2.40c to 2.75c. Business to date in March has been dull, but quick improvement is foreseen.

New York, March 20.—Among concrete reinforcing bar sellers here the price on mill shipments now is 2.00c, base, Pittsburgh, in all quarters. Owing to lack of business no real test has been made. Several important tonnages are expected to be acted on in the near future.

Philadelphia, March 20.—Prices on mill shipments of concrete bars continue 1.90c to 2.00c, base, Pittsburgh, for this district.

Pittsburgh, March 20.—Action still is deferred on a number of projects requiring 200 to 300 tons of reinforcing concrete bars. One or two road jobs have been let, the most important one, in Somerset county, taking 110 tons of road work and 15 tons of bridge steel, going to Truscon Steel Co. Mill buildings are scarce, but a number of hospitals, schools, etc., are up. Contracts taken at 1.80c and less are expiring, and 1.85c to 1.90c is quoted for second quarter. Some bookings have been made for that period.

Cleveland, March 20.—Dullness continues in the concrete bar market. No inquiries involving more than a carload or two were bought during the week, and awards were as small. Several attractive projects are active at Dayton, O. New billet bar prices continue 1.85c, Cleveland mill or Pittsburgh, with rail steel untested at 1.65c to 1.75c, mill.

Awards Compared

	Tons
Awards this week	5,880
Awards last week	9,280
Awards two weeks ago	4,380
Awards this week in 1927	10,945
Average weekly awards, Feb.	5,422
Average weekly awards, 1928	6,585
Total awards to date, 1927	58,125
Total awards to date, 1928	73,535

CONTRACTS PLACED

2000 tons, rail steel, industrial building, Chicago, to unstated fabricator.
1500 tons, cold storage building for meat packing, West Side, Chicago, to Joseph T. Ryerson & Son Inc.
400 tons, track construction work, Missouri Pacific railway, to Laclede Steel Co.
300 tons, memorial to women of the world war, Washington, to Dietrich Bros.
250 tons, settling basin of St. Louis waterworks at Hine, Mo., to Laclede Steel Co.
250 tons, school building, Detroit, to Concrete Engineering Co.
225 tons, University of Washington physics building, Seattle, to Pacific Coast Steel Co.
190 tons, fire department headquarters, Seattle, to Pacific Coast Steel Co.
150 tons, memorial hospital, Cumberland, Md., to unidentified eastern fabricator.
150 tons, Women's dormitory, Cornell university, Ithaca, N. Y., to Concrete Steel Co.
140 tons, garage, Nineteenth and Ludlow streets, Philadelphia, to Truscon Steel Co.
125 tons, 110 tons road steel and 15 tons bridge steel, route 456, Somerset county, Pa., to Truscon Steel Co.
100 tons, LaSalle college buildings, Philadelphia,to Baker Steel Co.
100 tons, Missouri highway office building, Jefferson City, Mo., to Laclede Steel Co.
Unstated tonnage, garage at Eighteenth and Ludlow streets, Philadelphia, to Truscon Steel Co.

CONTRACTS PENDING

8756 tons, highway projects, Erie county, N. Y.; bids to be asked early in April.
5257 tons, drainage improvement district to

No. 23, Los Angeles; bids rejected and new bids to be taken April 2.
1000 tons, Daily News building, Chicago.
900 tons, Dayton Biltmore hotel, Dayton, O.; Starrett Building Co., Chicago, awarded general contract.
500 tons, Y. M. C. A., Dayton, O.
475 tons, subway at Mura street, Los Angeles, general contract to S. M. Kerns.
400 tons, warehouse of the Great Atlantic & Pacific Tea Co. at St. Louis.
300 tons, sewage disposal plant, Elyria, O.; Breid, Lydon & Prandtre, Chicago, awarded general contract. George B. Gascoigne Co., Cleveland, engineer.
280 tons, power house and chemistry building addition, Ohio State university, Columbus, O.; award expected soon.
210 tons, highway, Albion-Batavia, N. Y.; bids in March 27.
200 tons, garage, Rochester, N. Y.; bids in.
150 tons, bridge over Willamette river at Springfield, Oreg.; bids in March 27.
100 tons, Cleveland clinic building addition, 2045 East Ninety-third street, Cleveland; Ellerbe & Co., St. Paul, architects.
100 tons, Convalescent hospital, Hammerville, Pa.; bids close March 23.
100 tons, rebuilding roundhouse, Connellsville, Pa., for Baltimore & Ohio railroad; bids about to be asked.
Unstated tonnage, 10-story hotel at Multnomah and Fourteenth streets, Portland, Oreg.; Lloyd Corp. having plans prepared.
Unstated tonnage, 1,000,000-bushel grain elevator, James Playfair, Midland, Ont.; C. D. Howe & Co., Port Arthur, Ont., engineers.

Building Dock for Water Shipment of Steel

The American Sheet & Tin Plate Co. is constructing a permanent pile and concrete dock at its Monessen, Pa., plant on the Monongahela river, modernly equipped with unloading facilities to permit loading of barges with sheet and tin plate for southern delivery by river. Three covered steel barges are now being loaded with sheet and tin plate, to be taken south in the next tow of the Carnegie Steel Co.'s line of steamers. The barges are being loaded to a capacity of 850 tons each.

The Carnegie Steel Co. received the first two of an order of ten covered steel barges, now being constructed by the American Bridge Co., at its Ambridge plant on the Ohio river. These barges which will be used to carry iron and steel products to points along the Ohio and Mississippi rivers, are each 175 feet long, 26 feet wide and 11 feet deep, equipped with a covered steel cargo box.

Soft Coal Mines Run 215 Days in 1926

Final statistics for the coal industry for 1926 show that the average number days worked in the bituminous industry was 215 and in the anthracite 244, according to the federal bureau of mines. Only one day was lost through strikes and lockouts in the bituminous industry and 26 in the anthracite.

Average number of employes in mine operations in the bituminous industry was 593,647 and in the anthracite 165,386. Output per man per day was 4.5 tons in the bituminous industry and 2.09 tons in the anthracite. The capacity of mines with the present labor force, assuming 304 working days in the anthracite field and 308 working days in the bituminous field, is 94,000,000 tons for the former and 821,000,000 tons for the latter.

Rails, Cars

New Railroad Activity Limited but Rail and Accessory Mills Busy—Equipment Buying Light

NEW buying by railroads is limited to small transactions. Rail orders of the week totaled 4000 tons at Chicago and track accessories 5000 to 6000 tons. Rail mills continue 90 per cent operations in the Chicago district, with accessory producers at the highest rate in more than a year. Equipment activity is limited to a few small inquiries and orders.

RAILROAD TRACK MATERIAL PRICES, PAGE 764

Chicago, March 20.—Rail mill operations continue at about 90 per cent with at least 30 days' backlogs of primary and a few orders of secondary rail tonnage of the 1928 programs. Another secondary order of 4000 tons was placed by a road with a terminal in Chicago. About 6000 to 10,000 tons of secondary tonnage is under negotiation. Light rail orders are in miscellaneous carload lots.

Inquiry for track fastenings is active, the total tonnage amounting to about 12,000 to 13,000 tons. Purchases in miscellaneous lots in the week were 5000 to 6000 tons. Production rate of track fastenings departments now is the highest in a year.

It is understood the ore cars and a number of others of the Chicago, Milwaukee, St. Paul & Pacific railroad inquiry will be bought soon, and the remainder of the 4660, on which bids have been asked, will be purchased early in April.

New York, March 20.—Car inquiries now pending aggregate around 8000. Unless there are some unexpected developments, March awards will be under February, when 9962 cars were placed. Passenger car inquiry is the lightest in weeks. Exclusive of 300 refrigerator express cars tentatively being figured by the Pennsylvania, it is doubtful if more than 50 coaches are pending. Locomotive demand is featureless.

Pittsburgh, March 20.—Frogs, switches, mine ties and other railroad supplies utilized in coal mining operations have been moving well considering the number of inactive mines, but billet light rail shipments have been poor. The assumption is that many of the recent light rail orders have been placed with the rerollers. Billet light rails are $36 and rerolled $34.

Track accessory buyers are specifying fairly well and makers claim to be getting 2.80c on both small and large spikes. Tie plate market has settled to 2.15c.

CAR ORDERS PLACED

Pittsburgh Coal Co., 600 mine cars, to Lorain Steel Car Co.
Pittsburgh Steel Co., three butt cars, to Pressed Steel Car Co.
Protane Corp., three tank cars, to General American Tank Car Corp.

LOCOMOTIVE ORDERS PLACED

Michigan Limestone & Chemical Co., two switch engines, to Baldwin Locomotive Works.

CAR ORDERS PENDING

Chinese Eastern railway, 990 box cars; bids open in May.
Chicago, Milwaukee, St. Paul & Pacific, 10 baggage cars.
Chicago Rapid Transit, 50 to 100 motor passenger cars, 50 to 100 trailer passenger cars.
Cudahy Packing Co., 200 freight cars, inquiry reported withdrawn.
Northern Pacific, 50 caboose underframes.
Southern Pacific, 250 auto cars and 175 tank cars; bids asked.
Seaboard Air Line, 500 steel underframes for 42-ton box cars.

LOCOMOTIVE ORDERS PENDING

Minneapolis, St. Paul & Sault Ste. Marie, eight locomotives; bids asked.
Southern Pacific, 33 locomotives; bids asked. Previously noted as 13 to 16 pending.

Refractories

Orders Show Slight Increase and Outlook is More Encouraging

REFRACTORIES PRICES, PAGE 796

Pittsburgh, March 20.—Refractory makers' operations continue 60 or 65 per cent. Consumers do not carry stocks and most orders carry rush shipping instructions. Quoted market levels are well observed, with only a relatively small amount of intermittent price cutting. The order for a million or more brick for two open hearths, soaking pits, heating furnaces, etc., from the Timken Roller Bearing Co. is understood to have been divided among five or six brickmakers. Boiler settings for a Pittsburgh district plant requiring 1,000,000 brick also have been let. Some blast furnace linings are up for early letting this spring. More chrome brick is being utilized this year.

A study has been made by the bureau of standards of the analytical details involved in the analysis of bauxite and burnt refractories of high alumina content.

Wire

Fence Demand Gains as Spring Season Opens—Most Prices Held Firmly By Makers

HEAVY buying of nails recently has covered needs for so long that present prices, while held firmly are largely nominal and untested by buying. A few contracts have been booked at the higher levels. Mill operations are at 60 to 70 per cent. Demand for fencing is increasing as the season advances, the West being most active.

WIRE PRICES, PAGE 764

Chicago, Jan. 20.—Buying of woven wire fencing for spring use is active, and sales of wire products to manufacturing lines are steady. Demand for nails continues weak, as previous heavy shipments are being absorbed. Operations of western wire mills are slightly above 70 per cent. Prices are unchanged at $2.70, Chicago, or western mill, for nails, and 2.55c for bright plain wire.

Buffalo, March 20.—Specifications for wire are good, especially from automobile companies. Operation of Buffalo wireworks is fully 80 per cent. The 2.50c base on plain wire is firm.

Pittsburgh, March 20.—So much wire nail business was booked in December and January that some jobbers' requirements for the entire spring were met. This militates against the effectiveness of $2.65 on nails, quoted universally but not in actual application in shipping instructions. Some second quarter contracts have been booked at $2.65, but makers await specifications.

Manufacturers using wire are fairly active and furnish specifications regularly. The 2.50c base is firm. Total tonnage, however, is not sufficient to warrant mills operating above 60 per cent. Fencing is active, particularly for the South and Southwest.

Worcester, Mass., March 20.—New buying of steel wire and wire products is steady and covers a wide range. Inquiries are increasing and tonnage shipped in the first quarter compares favorably with that of first quarter last year. Shipments against contracts are well balanced as are mill stocks, but advance buying for second quarter is held close to actual needs. Nails in New England are moving slowly with jobbers' stocks large, booked at lower prices and now reflected in the effort of mills to hold nails to higher quotations of January.

Cleveland, March 20.—Although several wire and nail mills have not been in the market actively for second quarter business, fair covering has been under way. A northern Ohio jobber in the past few days closed on two cars of nails at $2.65, Cleveland. On spot business that price is holding for nails and 2.50c, Cleveland, on plain wire.

The federal specifications board, in care of bureau of standards, Washington, is distributing its proposed revision of general specifications for metals, No. 339. Comments and criticisms are desired by April 28 for consideration by the board.

Bolts, Nuts, Rivets

Progress Being Made in Booking Second Quarter Needs

NUT AND BOLT PRICES, PAGE 764

Chicago, March 20.—Second quarter contracting for bolts, nuts and rivets is progressing steadily, with about half the users covered. Resistance to prices is reported slight. The 3.00c contract price for structural rivets in carload lots is said to be holding firmly. Producers also are booking business farther east at 2.90c, Pittsburgh-Cleveland. Small rivets are on the basis of 70 and 10 to 70, 10 and 5 off. Stove bolts are holding at the recent 10 per cent advance. Specifications are slightly under February.

Pittsburgh, March 20.—Tonnage is increasing in nuts, bolts and rivets. Contracting for second quarter is proceeding at a good pace. Prices are firm at 70 off on nuts and bolts to the large buyer, and 60 off to the small. Anything sold in rivets since March 1 has been on the basis of 2.90c, Pittsburgh, or 3.00c Chicago. Manufacturers of small rivets have discontinued an extra 5 per cent, and now uniformly quote 70 and 10 off here. Operations are on a 60 per cent basis.

Cleveland, March 20.—Bolts and nuts are in active demand, specifications being heavier than last month or a year ago. Contracting for second quarter is on. Rivet sales continue to lag, despite an increase in the contract price on structural rivets for second quarter. Sellers report little resistance to the new figure.

Strip Steel

First Quarter Specifications Are Full —Prices Hold

STRIP PRICES, PAGE 764

Pittsburgh, March 20.—Stripmakers are receiving additional second quarter contracts. Ford Motor Co. distributed some fender stock orders here this week, and while the tonnage is disappointing, it is sufficient to indicate higher production is near. Other automotive users and consumers in diversified lines are also buying. Here they are maintaining 3.15c (2.90c for more than 3 tons) and the maximum prices in hot strips are obtainable on material difficult to make. The minimum hot strip figures are therefore more usual. Operations are approximately 75 to 85 per cent.

New York, March 20.—Good specifications continue against first quarter strip contracts, and little tonnage will be unspecified at the end of the quarter. In the meantime, there is little test of prices, as not much second quarter contracting has been done. The firmer tendency, which a couple of weeks ago took the form of withdrawal of lower prices by some makers, continues. Hot strip is 2.20c, base, Pittsburgh, for widths up to 12 inches, 2.10c for widths up to 6 inches and 1.90c for widths up to 3 inches. Cold rolled strip continues 2.90c, base, Pittsburgh, on large lots and 3.15c on small lots.

Worcester, Mass., March 20.—Cold rolled strip is active at firm prices. Inquiries are in increased volume and mills are operating at capacity. Prices remain 3.30c for lots under three tons on listed widths with usual reduction for larger lots. Stamped metal demand is also strong. Orders thus far this year show an increase of 20 to 30 per cent over 1927.

Youngstown, O., March 20.—Hot-rolled strip mills continue to receive fairly satisfactory volumes of specifications. Makers threaten to cancel unspecified first quarter tonnage April 1. Cold-rolled strip orders continue hand-to-mouth. Hot-rolled and cold-rolled so far show no price deviations.

Chicago, March 20.—Strip mill operations are estimated at fully 90 per cent. Specifications for hot rolled material have shown a notable gain this month, with deliveries lengthened to three or four weeks. Cold rolled strip shipments are four to six weeks deferred. The outlook for both hot and cold-rolled strip is good for at least six months. Automotive parts and the automobile works continue to lead in demand. Orders now are in larger quantities.

Hot rolled quotations are 2.30c to 2.50c, Chicago, for material under 3 inches; 2.20c to 2.30c for 3 to 6 inches; and 2.00c to 2.10c for 6 to 12-inch. For strip 12 to 24 inches the price is on the 1.95c plate base.

Most cold rolled business is on the basis of 3.15c, Pittsburgh and Cleveland. Up to 3.30c is obtained for small lots in addition to the quantity differentials. Mills in this district report prices for both hot and cold rolled firmer than in months.

Cleveland, March 20.—Continuance of strip steel specifications at a high rate enables mills to operate 80 to 100 per cent. Specifying against first quarter contracts took new impetus as the deadline approached for getting out material on former prices. Hot strip steel prices are firm at 1.90c to 2.00c for 6 to 12-inch, Pittsburgh. Cold rolled strip prices are 2.90c and 3.15c, Cleveland, with not much new demand.

Nonferrous Metals

Sharp Recovery in Price of Tin Features Quiet Market of Past Week—Shipments on Old Orders Are Good but New Business Lags

Prices of the Week, Cents a Pound

	Copper, Electro delivered	Copper, Lake delivered	Copper, Casting refinery	Straits Tin, New York Spot	Straits Tin, New York May	Lead, New York	Lead, East St. Louis	Zinc, St. Louis	98-99% Aluminum	Spot Antimony	Ingot Nickel
Mar. 14	14.10	14.22½	13.85	50.55	50.55	6.02½	5.80	5.67½	23.90	10.37½	35.00
Mar. 15	14.10	14.22½	13.85	50.87½	50.75	6.00	5.80	5.65	23.90	10.37½	35.00
Mar. 16	14.10	14.22½	13.85	51.62½	51.50	6.00	5.80	5.62½	23.90	10.62½	35.00
Mar. 19	14.10	14.22½	13.85	53.00	53.00	6.00	5.80	5.70	23.90	10.50	35.00
Mar. 20	14.10	14.22½	13.85	52.25	52.25	6.00	5.80	5.70	23.90	10.20	35.00

NEW YORK, March 20.—Price changes were small in the nonferrous metal market during the past week, except for a rather sharp recovery in tin which accompanied the best buying of this metal in some time. New business in the other metals lagged but shipments on old orders were large.

Large shipments were counterbalanced by heavy production. Copper shipments in February were the largest ever made in that month. Exports were large but the improvement in domestic shipments particularly attracted attention. February shipments of zinc were of good size. This is the one metal in which curtailment of output has made progress. Joplin ore production was cut last week and this was reflected in the price of slab zinc immediately.

Copper—Most metal is held at 14.12½c, Connecticut, and 14.25c, Midwest, but some is offered about 14.07½c, Connecticut, and some has been sold lately for even a little less. The market is quiet and so a few sellers, mostly small ones, seek business. Producers are well booked for this month, with April fairly well covered but practically no metal is sold for later delivery. The export market has been active on some days and the price is unchanged at 14.50c c.i.f., European ports.

Tin—Buying of tin this past week has been the largest in a long time, with all positions from spot to September active, but mostly early months. The price fell to 50.00c, the lowest in several years, about a week ago, and then recovered to 53.00c on Monday. This recovery was too sudden to hold, and before the day was over the price had fallen ⅜-cent and today was still lower at 52.25c. The bulk of the week's business was done at 51.00c or a little less. The statistical outlook for March is stronger but there is no change regarding larger production. Use here and in Europe is large.

Zinc—Business has been quiet and prime western prices have changed little. But with ore up to $39 a ton, some at $40, and production of ore cut, the metal market showed a stronger tendency quickly. The higher price may bring out some business.

Lead—The market is steady with business moderate, after good buying early this month. The market here is firm enough but strength is retarded by the situation in Europe.

Aluminum—Prices are holding steady with some light buying for early shipment being done.—*Daily Metal Trade.*

"Purchasing Department Routine and Procedure" was the subject discussed at the March meeting of the Purchasing Agents' association of Pittsburgh, March 20. W. A. Forrester, director of purchases, Westinghouse Airbrake Co., East Pittsburgh, Pa., spoke at length from his personal experience.

Mill Products

Base prices cents per pound f.o.b. mill

SHEETS	
Yellow brass (high)	18.75
Copper, hot rolled	22.75
Lead, full sheets (cut ¼c more)	9.75
Zinc (100-pound base)	9.50
Aluminum, flat sheets, up to 10 gage, 3" to 72" wide	31.30
SEAMLESS TUBES	
Yellow brass (high)	23.62½
Copper	24.50
RODS	
Yellow brass (high, full turning)	16.50
Naval brass	19.25
WIRE	
Copper, small lots	15.62½
Yellow brass (high)	19.25

Old Metals

Dealers' buying prices, cents per pound

HEAVY RED BRASS	
New York	9.25
Chicago	9.25 to 9.50
Cleveland	9.25 to 9.50
HEAVY YELLOW BRASS	
Chicago	6.75 to 7.00
Cleveland	7.25 to 7.50
ZINC	
New York	3.50
Cleveland	3.00 to 3.25
HEAVY COPPER AND WIRE	
New York	11.50 to 11.75
Boston	10.75 to 11.25
Chicago	10.50 to 11.00
Cleveland	11.50 to 11.75
RED BRASS BORINGS	
New York	8.25 to 8.50
YELLOW BRASS TUBING	
Cleveland	7.50
LIGHT COPPER	
New York	10.00 to 10.25
Chicago	9.50 to 9.75
Cleveland	10.00 to 10.25
LIGHT BRASS	
Boston	5.75 to 6.00
Chicago	6.25 to 6.75
Cleveland	5.50 to 5.75
ALUMINUM	
Clippings, Cleveland	17.50
Borings, Cleveland	9.50
Cast, Cleveland	13.00
Cast, Boston	11.50 to 12.00

Secondary Metals

Remelt Aluminum No. 12	17.00 to 17.50
Brass ingot, 85-5-5-5	12.25 to 12.50

Coke By-Products

Toluol and Sulphate Are Moving Well —Most Prices Are Firm

New York, March 20.—Toluol demand is brisk. Sellers are having difficulty meeting requirements, although supplies to date have proved adequate. Not only is the automotive industry contributing heavily to demand for this distillate, but several others where consumption of lacquer has been large. Both pure and 90 per cent benzols are moving in better volume than in several weeks. The rubber industry is a particularly large consumer. Solvent naphtha and commercial xylol, on the other hand, are moving rather sluggishly, and their prices are none too strong. Prices of pure and 90 per cent benzols and toluol still hold. Notwithstanding activity in the latter product, it is doubtful if there will be any early revision in prices.

Sulphate of ammonia also is in good spot demand, with the domestic market firm. Naphthalene continues in good demand from the drug trade.

Coke Oven By-Products

Per Gallon at Producers' Plants in Tank Lots

	Spot	Contracts
Pure benzol	$0.22	.....
90 per cent benzol	0.22	.....
Toluol	0.35	.....
Solvent naphtha	0.30	.....
Commercial xylol	0.30	.....
Phenol	0.19 to 0.20	.....

Per pound at Producers' Plants

Naphthalene flakes	0.05 to 0.05½
Naphthalene balls	0.06 to 0.06½

Per 100 Pounds Delivered

Sulphate of ammonia	$2.35

Quicksilver Price Firm

New York, March 20.—Quicksilver is stronger at $123 to $125 a flask, due to the situation abroad. Buying is moderate.

Warehouse

Development Is Slow in Demand from Spring Consuming Lines—Prices Firmer Excepting Downward Revisions at Los Angeles

ALTHOUGH improvement in warehouse sales continues evident, the upward swing has not been as rapid as expected for the season. Many jobbers thought March would be one of the best months of the year. Prices generally were unaltered in the week, except for a downward revision of prices at Los Angeles, most products there being cut $2 a ton.

Concessions have disappeared in the Boston warehouse district and a slightly firmer price situation exists, although business remains quiet.

Trading in the New York metropolitan district is more active than in several weeks. Structurals are moving particularly briskly. It now appears that March unquestionably will surpass the showing for either of the two preceding months of this year. Prices are unchanged, although weakness still prevails in steel bars, due in no small measure to foreign importations.

Buffalo warehouses report no general opening up of spring business. Sales are running slightly behind 1927 to date, with indications the first quarter will end with a similar record.

Continued interest is being shown in the Cleveland warehouse market by a wide field of consumers. The volume of business is about the same as last year at this time and a month ago, with sheet warehouses reporting a slight improvement lately. The galvanized sheet price is still weak at 4.60c. Sales of concrete steel bars have fallen off considerably.

St. Louis jobbing business is holding its own in good shape. Sales in the first half of March are somewhat higher than last year, and one important interest reports a gain for the month to date of 15 per cent. Railroad repair shops still are active, and the same is true of public utility shops, especially the interurban and city surface lines. Materials for spring and early summer repair and extension work are being ordered and there is a steady call for road building items. The general manufacturing trade is accounting for liberal tonnages of miscellaneous goods, and prices are steady to firm.

Los Angeles jobbers have reduced prices $2 a ton on bars, plates and srapes and $2 on sheets. Cold finished bars has been marked down to 4.50c.

Philadelphia warehouse conditions are unchanged, excepting an occasional shading of black and galvanized sheets. March sales totals compare favorably with those of February.

Warehouse Quotations in Cents Per Pound at Leading Market Centers

STEEL BARS

Baltimore	2.60c to 3.31c
Boston	3.265c
Buffalo	3.30c
Chicago	3.00c
Cincinnati	3.30c
Cleveland	3.00c
Detroit	3.00c
Ft. Worth	3.75c
Houston	3.00c
Los Angeles	3.30c
New York	3.09c to 3.24c
Philadelphia*	2.50c
Pittsburgh	2.90c
Portland	3.00c
San Francisco	3.15c
Seattle	3.00c
St. Louis	3.15c
St. Paul	3.25c
Tulsa	3.75c to 4.06c

*Plus quantity differentials.

IRON BARS

Baltimore	2.60c to 3.31c
Boston	3.265c
Buffalo	3.30c
Chicago	3.00c
Cincinnati	3.30c
Detroit	3.00c
Ft. Worth	3.75c
New York	2.80c to 3.24c
Philadelphia*	2.50c
St. Louis	3.15c
Tulsa	3.75c to 4.06c

*Plus quantity differentials.

REINFORCING BARS

Baltimore	2.60c to 3.31c
Boston	3.265c to 3.50c
Buffalo	2.75c
Cincinnati	3.15c
Cleveland	2.20c
Detroit	3.00c
Ft. Worth	3.50c
Houston	3.00c
*Los Angeles	3.05c
**Los Angeles	3.30c
New York	2.95c
Philadelphia	2.40c to 2.90c
Pittsburgh	2.90c to 3.175c
*San Francisco	2.85c
**San Francisco	3.10c
Seattle	3.00c
St. Louis	3.15c
Tulsa	3.75c to 4.00c
Youngstown	2.30c to 2.60c

*Carload. **Less carload.

STRUCTURAL SHAPES

Baltimore	2.60c to 3.41c
Boston	3.365c
Buffalo	3.40c
Chicago	3.10c
Cincinnati	3.40c
Cleveland	3.00c
Detroit	3.10c
Ft. Worth	4.25c
Houston	3.25c
Los Angeles	3.30c
New York	3.34c
Philadelphia	2.40c to 2.80c
Pittsburgh	3.00c
Portland	3.00c
San Francisco	3.15c
Seattle	3.00c
St. Louis	3.25c
St. Paul	3.35c
Tulsa	3.75c to 4.16c

PLATES

Baltimore	2.60c to 3.41c
Boston	3.365c
Buffalo	3.40c
Chicago	3.10c
Cincinnati	3.40c
Cleveland, ¼-in. and thicker	3.00c
Cleve., 3/16-in.	3.20c
Detroit	3.10c
Detroit, 3/16-in.	3.30c
Ft. Worth	4.00c
Houston	3.00c
Los Angeles	3.30c
New York (sheared and universal)	3.34c
New York (floor)	5.25c
Philadelphia	2.40c to 2.80c
Phila., 3/16-in.	2.60c to 3.00c
Pittsburgh	3.00c
Portland	3.00c
San Francisco	3.15c
Seattle	3.00c
St. Louis	3.25c
St. Paul	3.35c
Tulsa	3.75c to 4.16c

No. 10 BLUE ANNEALED SHEETS

Baltimore	3.10c to 3.66c
Boston, 3/16-in.	3.915c
Buffalo	3.70c
Chicago	3.50c
Cincinnati	3.60c
Cleveland	3.25c
Detroit	3.50c
Ft. Worth	4.70c
Houston	3.90c
Los Angeles	3.90c
New York	3.79c to 3.89c
Portland	4.00c
Philadelphia	3.15c
*Pittsburgh	3.10c
San Francisco	3.75c
Seattle	4.00c
St. Louis	3.60c
St. Paul	3.75c
Tulsa	4.20c to 4.56c

*Price on 25 or more sheets.

No. 24 BLACK SHEETS

Baltimore	3.60c to 4.30c
Boston	5.00c
Buffalo	4.20c
Chicago	3.95c
Cincinnati	4.05c
Cleveland	3.75c
Detroit	4.10c
Ft. Worth	4.70c
Los Angeles	5.00c
New York	4.10c
Philadelphia	4.15c
Pittsburgh†	3.75c
Portland	4.90c
San Francisco	4.95c
Seattle	5.00c
St. Louis	4.45c
St. Paul	3.95c
Tulsa	4.75c

†Price on 10 to 24 bundles.

No. 24 GALVANIZED SHEETS

Baltimore	4.30c to 5.45c
Boston	5.85c
Buffalo	5.05c
Chicago	4.80c
Cincinnati	4.90c
Cleveland	4.60c
Detroit	4.90c
Ft. Worth	5.75c
Houston	5.30c
Los Angeles	5.35c
New York	4.70c
Philadelphia	5.00c
Pittsburgh†	4.60c
Portland	5.65c
San Francisco	5.50c
Seattle	5.75c
St. Louis	5.25c
St. Paul	4.90c
Tulsa	5.55c

†Price on 10 to 24 bundles.

BANDS

Baltimore	3.25c to 4.06c
Boston	4.015c to 5.00c
Buffalo	4.05c
Chicago	3.65c
Cincinnati	3.95c
Cleveland	3.65c
Detroit	3.65c
Ft. Worth	4.40c
Houston	3.65c
Los Angeles	4.25c
New York	3.99c
Philadelphia	3.35c
Pittsburgh	3.60c
Portland	4.00c
San Francisco	4.00c
Seattle	4.00c
St. Paul	3.90c
Tulsa	4.71c

HOOPS

Baltimore	4.16c
Boston	5.50c to 6.00c
Buffalo	4.05c
Chicago	4.15c
Cincinnati	4.40c
Cleveland	3.65c
Detroit	4.15c
New York	4.49c
Philadelphia	3.60c
Pittsburgh	4.50c
Seattle	5.00c
St. Paul	4.40c

COLD FINISHED STEEL

	Rounds, hexagons,	Flats, squares
Baltimore	3.25c	3.75c
Boston	3.45c	3.95c
Buffalo	3.95c	4.45c
Chicago	3.60c	4.10c
Cincinnati	3.85c	4.35c
Cleveland	3.65c	4.15c
Detroit	3.85c	4.35c
Los Angeles	4.50c*	.....
New York	3.40c	3.90c
Philadelphia	3.35c	3.85c
Pittsburgh	3.60c	4.10c
Portland	5.00c*	.....
San Francisco	4.25c*	.....
Seattle	5.00c*	.....
St. Paul	3.85c*	.....
Tulsa	4.66c	5.16c

*Rounds only.

COLD ROLLED STRIP

Boston, 0.100-inch, 500 pound lots	5.30c
Buffalo	5.85c
Chicago*	6.10c
Cincinnati	7.15c
Cleveland*	5.95c
Detroit	5.80c
New York	5.15c
Philadelphia†	5.00c

*Net base, straightening, cutting, boxing one ton or more.

†Plus mill, size and quantity extras.

SWEDISH IRON AND STEEL

New York duty paid

Hollow drill steel	14.00c
Iron bars, rounds	6.25c

Flats and Squares

Baltimore, New York, Phila.	6.60c

High Demand on Coast

Sales Not Large but Pending Projects Call for Much Iron and Steel

SAN FRANCISCO, March 17.—(*By Air Mail*)—While steel bookings this week were not heavy, considerable new work is in sight and being figured. Interest centers in the aqueducts for the East Bay municipal utility district at Oakland. Corrected estimates show 4830 tons of plates or 17,440 tons of cast iron pipe for the Wildcat aqueduct and 3668 tons of plates or 13,250 tons of cast iron pipe for the Sequoia aqueduct. The largest award of the week involved 3096 tons of cast iron pipe for Southgate, Calif.

Pig Iron and Coke

Movement of pig iron and coke continues confined to relatively small lots. Foundry operations have shown little improvement the past thirty days. Another shipment of English coke and Indian iron has arrived. Approximately 4000 tons of English coke has arrived at Los Angeles; part of the cargo will be unloaded later at San Francisco. The India iron shipment contained 1250 tons, of which San Francisco and bay district foundries took 700 tons, Los Angeles foundries 400 tons, and 150 tons were reshipped from San Francisco to Portland and Seattle. No change is noted in prices.

Coast Pig Iron Prices

Utah basic	$25.00 to 26.00
Utah foundry	25.00 to 26.00
*German	24.25
*Indian	24.00 to 25.00
*Dutch	24.50

*C.i.f. duty paid.

Bars, Plates and Shapes

The largest concrete bar award of the week called for 475 tons for the Myra street subway in Los Angeles, placed with an unknown interest. Awards aggregated 712 tons, bringing the total for the year to 19,229 tons, compared with 12,267 tons for 1927. Bids on 5257 tons for drainage improvement district No. 23, Los Angeles, were returned unopened and new bids will be opened April 2. Pending tonnage exceeds 14,000 tons.

Demand for plates is better and several projects are now up for figures involving fair sized lots. Awards this week included 2000 tons for a penstock at Seattle, booked by the Puget Sound Machinery Depot. To date this year 9024 tons have been placed, compared with 10,086 tons for last year. The plate material specified in the Oakland aqueducts call for 7/16-inch plates. Alternate bids on cast iron and concrete, steel lined, will also be taken. The Morrison and Horseshoe Canyon siphons of the Kittitas Canal project at Yakima, Wash., come up for figures on April 10. Approximately 450 tons of plates are involved. Prices are firm at 2.30c c.i.f.

Structural shape awards aggregated close to 6300 tons for the week and brought the total for the year to 40,114 tons, compared with 45,908 tons for the corresponding period in 1927. Pending business will require more than 15,000 tons. Bids were opened this week on 4000 tons for the Capwell store in Oakland. A highway bridge in Del Norte county, Calif., will take 600 tons and bids will be opened March 27 for two bridges in Oregon requiring 750 tons. Plain domestic material is firm at 2.35c c.i.f.

Other Finished Material

The feature of the cast iron pipe market was the placing of the largest award so far this year. This project involved 3096 tons for Southgate, Calif., and went to Leo Vuksich, a general contractor. Awards this week totaled 3701 tons, bringing the aggregate for the year to 19,942 tons, compared with 25,165 tons for the same period last year. Santa Barbara, Calif., rejected all bids on 663 tons and has called for new bids to be opened March 22. Demand is quiet, but much new work is being planned and should be up for figures shortly. The only standard pipe award called for 100 tons of 6 and 8-inch lapweld pipe for Monrovia, Calif., taken by the Santa Fe Pipe & Supply Co. Brighouse, B. C., will open bids next week on 510 tons of seamless pipe. Grinnell Co. was low bidder on 360 tons of seamless pipe, bidding 89 cents a foot.

Northwest Active

Building Takes Shape Tonnage—Steel Pipe Lines Require Plates

Seattle, March 14.—Award of the general contract for the construction of the Bon Marche department store buildings and several projects involving about 5000 tons of plates featured the Pacific Northwest iron and steel market this week.

The Bon Marche, which will occupy an entire city block, will be of fireproof construction, six stories, and will cost $2,750,000. It is the largest building project of its kind in the state at this time. Teufel & Carlson, Seattle, have the general contract. Both structurals and reinforcing materials in considerable tonnage will be involved but the quantities have not been released.

Pig Iron and Coke

Conditions in the foundry industry are unchanged. Business is improving with increased work from canneries and mills. Buying of pig iron and coke is not active, as local stocks are fairly large. About 400 tons of Burn India iron have been imported into this territory where it is reported to be giving good results. This grade is selling at $25 f.o.b. plant. Practically no European iron is being bought here but the movement of Columbia is quite steady. Some foreign coke is afloat for discharge here.

Bars, Plates and Shapes

Mill prices are unchanged with merchant bars and shapes steady at 2.35c and plates firm at 2.30c. Representatives of eastern mills state that while business is quiet the market is steady and indications are generally satisfactory.

Mill prices of reinforcing material are now reported at 2.20c and better. The Pacific Coast Steel Co. was awarded 225 tons for the university physics building and 190 tons for Seattle fire department headquarters.

The largest plate award of the week totaled about 1550 tons for 4854 feet of 78-inch pipe for Seattle's Cedar river water system. The general contract went to J. M. Clapp at $289,506. The pipe will be fabricated by the Puget Sound Machinery Depot. Bethlehem Steel Co. will supply 1000 tons of plate for a pipe line job at Tacoma, general contract to Birchfield Boiler Works. Barde Steel Co., Seattle, has the contract for 425 tons of plates for rebuilding the steamer IROQUOIS, general contract to the Washington shipyards. Of this tonnage 250 tons will come from Barde stock and 175 tons from the Central Iron & Steel Co. Other tonnage pending includes 800 tons for three lightships to be built at Portland by the Albina Marine Engine Works and 200 tons for a pipe line for Everett, Wash., bids now in for the general contract.

No Reason Is Given For Merger Failure

Youngstown, O., March 20.—At the stockholders' meeting of the Youngstown Sheet & Tube Co. here March 15, President James A. Campbell told stockholders that their directors and officers had seen fit to break off negotiations for the merger with Inland Steel Co., Chicago. No other reason was advanced.

The number of directors was decreased from 14 to 11, for one thing due to the death in the past year of three members of the board, J. G. Butler Jr., E. L. Ford and Robert Bentley.

Chain Operations Good

Worcester, Mass., March 20.—Makers of chain have good order books and are operating at capacity. In some instances schedules are 15 per cent heavier than a year ago. The increase is largely due to demand from the agricultural and oil well drilling lines.

Steel Castings Orders Drop Slightly

Washington, March 20.—February bookings of commercial steel castings dropped slightly from the January figure, statistics furnished by the department of commerce show. Monthly comparisons follow:

	BOOKINGS		PRODUCTION	
Total	*Total net tons	Railway specialties	*Total net tons	Railway specialties
1926	1,035,778	404,945	1,135,955	427,016
1927				
Feb.	94,683	41,355	88,915	35,322
March	90,041	34,680	102,836	41,232
April	81,044	32,279	94,677	39,189
May	72,744	28,946	86,942	35,236
June	90,898	39,455	87,767	34,596
July	74,246	31,011	79,726	32,576
Aug.	63,528	21,144	87,004	32,397
Sept.	52,351	18,396	70,024	25,618
Oct.	51,748	16,625	62,409	21,947
Nov.	62,683	27,639	58,997	19,146
Dec.	76,953	39,112	58,220	19,358
Total	918,698	384,103	964,603	370,654
1928				
Jan.	90,069	41,276	74,079	28,714
Feb.	90,059	41,096	82,626	37,719

*For tonnage of miscellaneous castings deduct Railway Specialties from this total.

Auto Production Stays on Increase

Washington, March 20.—Automobile production in February in the United States totaled 323,368 passenger cars and trucks, continuing its increase started in January. Following are monthly comparisons, furnished by the department of commerce:

	—United States—			Canada†
	Total	Passenger Cars	Trucks	Total
1926	*4,298,802	3,808,753	*490,049	*204,550
1927				
Feb.	304,763	264,171	40,592	18,655
March	394,436	345,911	48,525	23,250
April	404,745	357,009	47,736	24,611
May	*404,106	*357,150	*46,956	25,708
June	*321,960	*278,729	43,231	19,208
July	*268,476	*236,868	31,608	10,987
Aug.	*308,819	*274,381	*34,438	12,526
Sept.	*260,382	*226,443	33,939	11,262
Oct.	*219,712	*183,042	36,670	7,791
Nov.	*134,411	*109,758	24,653	6,617
Dec.	*133,551	106,079	*27,472	3,435
Total	*3,394,288	*2,939,191	*455,097	179,426
1928				
Jan.	*231,647	*205,543	*26,104	8,463
Feb.	323,368	290,830	32,538	12,304

†Reported by Dominion bureau of statistics.
*Revised.

Steel Barrel Output Makes Gain

Washington, March 20.—Steel barrel production in February made a notable gain over January, according to department of commerce statistics. Members of the Steel Barrel Manufacturers' association, Cleveland, report 313,163 barrels shipped in February, with unfilled orders of 469,553 barrels. February volume of business totaled $949,824.00. I. C. C. barrels were produced at 28.7 per cent of capacity, light barrels at 52 and all barrels at 47.1. Monthly comparisons follow:

1927	Production	Shipments	Unfilled orders for delivery within 30 days	Unfilled orders for delivery beyond 30 days
Feb.	504,134	503,183	252,012	1,411,760
Mar.	575,850	568,821	285,802	1,260,278
Apr.	599,771	609,090	296,395	1,069,160
May	588,077	575,712	250,029	947,865
June	594,782	605,123	232,468	966,371
July	578,223	576,602	308,789	1,037,899
Aug.	615,152	610,454	244,518	862,086
Sept.	521,899	525,374	235,181	889,256
Oct.	578,408	572,893	211,665	788,894
Nov.	500,909	497,345	182,065	633,724
Dec.	444,227	454,638	221,897	1,086,468
1928				
Jan.	475,906	474,159	241,145	1,110,652
Feb.	518,944	514,362	297,889	1,119,738

Approves Plant Extension

A financing program that will yield approximately $277,000 in common stock was announced March 19 by Steel & Tubes, Inc., Cleveland. Proceeds will be used largely to cover the cost of the first unit of a conduit plant to adjoin the company's Mohegan division at Brooklyn, N. Y. which was acquired last July. The new unit will be used for galvanizing and enameling purposes. The company recently authorized the construction of a continuous hot strip mill for erection this year at its Elyria, O., plant.

Bessemer Iron Is Easier

(*Concluded from Page* 765)

the strengthening of the market to the west, due to the firmer quotations in the St. Louis district, has aided the local price situation. Middle interests are finding supplies tight.

St. Louis, March 20.—Demand for pig iron is holding up fairly well, but the principal feature is that shipments are at the highest rate this year. Shipments also average considerably above the corresponding period in 1927. Improvement in the melt is steady, users generally are willing to take all iron due them on contract. The leading local producer is operating at practically capacity and is shipping slightly more than current output. The movement from the South and North also is large. Sales reported in the past week totaled approximately 4200 tons. The St. Louis Coke & Gas Corp. booked 3000 tons. The largest single transaction was 1000 tons of foundry iron for an Illinois specialty maker. Prices are steady.

Birmingham, Ala., March 20.—Pig iron sales are limited to small lots. Shipments are larger than output. Nine furnaces are on foundry iron. The price is firm at $16, base, Birmingham.

Philadelphia, March 20.—Eight thousand tons of English foundry iron was received here in the past week for delivery to R. D. Wood & Co.'s pipe plant, Florence, N. J. Three hundred tons was received from Rotterdam. It is understood these are the first shipments on an order for 30,000 tons of foreign iron which the Wood company placed recently at $18.50, duty paid, delivered at Florence. The remaining tonnage is to arrive shortly. A round tonnage of English low phosphorus iron also was received here in the past week. Most of it was sold prior to arrival, but several carloads were sold after arrival at $23 to $24, duty paid, tidewater. A lower price was reported in one instance. The market otherwise is quiet, although specifications continue fair. Prices are steady.

The recent reduction in certain freight rates on pig iron announced by the Reading Co. applies to only three points of origin and to three delivery points. The rates which were changed are those from Reading to Topton, Pa.; Reading, Catasauqua and Bethlehem to Macungie, Pa.; and Bethlehem to Emaus, Pa. Formerly these five hauls carried a $1.01 rate. The new rate is 88 cents per gross ton in carloads.

The Bethlehem Steel Co. lighted one of its blast furnaces at Coatesville, Pa., March 14, producing basic iron.

Cold Finished Steel

Second Quarter Contracts Being Booked at Old Price

COLD FINISHED PRICES, 764

Pittsburgh, March 20.—Contracting for second quarter in cold finished bars has gained considerable headway with reaffirmation of the first quarter price, 2.20c. Specifications on first quarter contracts are largely filed and most tonnage is going to automotive users. Bookings of second quarter business at an unchanged figure enlarges the possibility of heavier carryover from first quarter. Operations continue at about 75 per cent.

Cleveland, March 20.—A new standard classification card of extras on cold finished alloy steel bars has been adopted by leading makers, effective March 16, following the alteration in hot rolled alloy price schedules. The principal changes in the new card over the old list consist of material reductions in net extras for size on squares and hexagons and in dropping the annealing and heat treating extra to a 0.20 to 0.30 carbon range with 75 cents per 100 pounds as the extra. A charge of 75 cents formerly was made on carbon of 0.25 to 0.35.

Demand in the past week has improved following the lull which resulted from the reaffirming of 2.25c, Cleveland, for second quarter, when an advance had been expected.

Arranges Coal Meeting

The Ohio section of the American Institute of Mining and Metallurgical Engineers has arranged a meeting to be held at Columbus, O., April 21. The subject of the meeting will be "Mechanization of Coal Mines," and members of the National Coal association, American Society of Mechanical Engineers and the Southern Ohio Pig Iron and Coke association have been invited to participate. The program calls for an inspection trip in the morning, a luncheon at noon, a meeting at Ohio State university in the afternoon and a dinner at the Faculty club of the university in the evening.

Canadian Iron and Steel Commerce Grows

Toronto, Ont., March 20.—Imports of iron and its products into Canada in the year ended Jan. 31, 1928, show general increase over the corresponding period ended January, 1927, according to the department of trade and commerce, Ottawa. Iron and its products imported in January were valued at $15,599,391 and for the year ended with January, 1928, $249,145,395, compared with $221,807,977 in the previous year.

Exports of iron and its products in January were valued at $4,786,250 and for the twelve months ended with January, $66,802,201, which compares with $76,012,649 for the corresponding period, ended with January, 1927. Comparison of a few items is made in the following tables:

Imports

	Year ending Jan. 31, 1928	Year ending Jan. 31, 1927
Iron ore	$ 2,884,238	$ 2,831,627
Pigs, ingots, etc.	1,927,238	1,564,409
Rolling mill products, n.o.p.	43,110,603	47,842,267
Engines and boilers	16,824,319	14,009,751
Machinery	47,066,718	39,296,734
Tools	2,491,569	2,368,464

Exports

Pigs, ingots, etc	2,929,916	3,504,629
Scrap	807,664	644,870
Bars and rods	655,893	1,038,196
Rails	1,047,004	516,388
Engines	184,498	299,332
Machinery	5,723,480	4,473,879

During January exports of iron and steel to the United States from Canada were 4997 gross tons, which compares with 5471 tons in January, 1927.

Imports to Canada from the United States in January were 61,647 gross tons, compared with 56,213 tons in January, 1927. Imports from the United States included 742 tons of rails, 1536 tons of galvanized sheets, 7933 tons of plates not fabricated, 2226 tons of tin and terne plate, 3759 tons of black sheets, 4703 tons of steel bars, and 11,535 tons of steel scrap.

Expect Better Business

Pittsburgh, March 20.—Better business in the second quarter of 1928 than in the second quarter of 1927 is expected by practically all shippers in the Allegheny district. Prospective freight car requirements, as told at the recent meeting of the Allegheny regional advisory board, contemplate an increase of 8.3 per cent. The next meeting of the board will be at Steubenville, O., June 14.

Stoker Sales Heavier

Washington, March 20.—Sales of mechanical stokers in February totaled 85 or an increase of 10 over January as the following comparison by the department of commerce shows:

	Stokers sold	Fire tube boilers	Water tube boilers
1926 total	1,361	289	1,072
1927			
February	105	27	78
March	115	25	90
April	77	22	55
May	97	16	81
June	153	49	104
July	136	42	94
August	160	60	100
September	104	48	56
October	95	37	58
November	67	26	41
December	83	29	54
1927 total	1,261	399	862
1928			
January	75	20	55
February	85	26	59

To Expand Sheet Listings

Manufacturers of products fabricated of sheet steel are being urged by the Sheet Steel Trade Extension committee, Oliver building, Pittsburgh, to send in complete lists of their products and trade names to augment the material to be presented in the second edition of "5000 Sheet Steel Products and Who Make Them." Successful reception of the first edition, prompts a more complete volume.

Inspect Arc-Welded Steel Building

ENGINEERS from many fields gathered at the West Philadelphia works of the General Electric Co. last week to inspect a large arc-welded steel building just completed. This building, which connects with the main part of the plant, will be used for the manufacture of arc-welded steel tanks of various kinds and sizes. Exclusive of the headhouse which extends across the front end, the building is 138 feet wide and 474 feet long and contains approximately 990 tons of steel. The designing engineers estimate that 125 tons was saved through the use of welded construction.

The steel design used in this building contains several new features even for arc-welded buildings. The main aisle trusses which have a span of 78 feet are built up with the newly designed 8-inch section beams of the Carnegie Steel Co. for top and bottom chords. These beams are placed with flanges vertical and to them channel diagonals are welded on the outside and 7-inch I-beam verticals are welded on the inside. By thus welding diagonals and verticals directly to chord flanges the use of over 1200 gusset plates was avoided. In designing the building, standard ⅜-inch fillet welds were made and tested in shear and in this way, a unit shearing stress or safe load of 3000 pounds per linear inch was obtained. This gives a factor of safety of at least four.

The method of anchoring columns to footings is unique and its simplicity and low cost seems to indicate that it will be extensively used even on riveted steel buildings. Each column rests on a 1½-inch base plate which in turn rests on the concrete footing. The anchor bolts, two to each column, extend up from the footing between the column flange and a short angle standing vertically with outer edges of both legs welded to the base of the column flange. On the upper end of this angle there is a plate washed against which the anchor bolt nut bears. The device is exceedingly simple. The total length of weld has been made sufficient to give shear strength equal to the tension strength of the two anchor bolts.

The building equipment includes a somewhat unusual crane layout. In the headhouse a 10-ton bridge crane has a span of 73 feet. Other 10-ton bridge cranes operate the full length of the main aisle. Below the main crane runway on either side of the main aisle are wall crane runways. These are supported on brackets carried by the auxiliary crane columns and the main columns. As these cranes exert horizontal forces at both upper and lower levels as well as vertical forces at the lower level their runway supports are not simple.

The building is said to exceed all previous welded buildings in its use of trusses. These trusses were fabricated at the Trenton shops of the American Bridge Co. Five welders, each with a welding outfit, were used to a truss.

When depositing the standard ⅜-inch triangular fillet the arc voltage ranged from 23 to 25 and the amperes from 175 to 180. Wherever possible jigs were used to assist in assembling the truss parts. The 206 skylight trusses were almost identical. These were quickly assembled in special pigs, were clamped together with ordinary hand clamps and then taken to the welding floor.

Careful control of the actual welding was maintained at all times. Before any welder was allowed to work on the building, he was given certain tests by a capable welding inspector. As a result of the success in the construction of this welded building, the General Electric Co. has issued a general order specifying arc welded design for all its new steel construction.

Price Decline Affects Steel

Corporation Earnings

Adverse Conditions in Iron and Steel Trade Reflected in Annual Statement for 1927—First Report in Corporation's History Signed by Other Names Than Late Judge Gary—Improvements Made

EFFECTS of adverse conditions in the iron and steel industry, during 1927, are reflected in the annual report of the United States Steel Corp. for the year. The report carries the signatures of J. Pierpont Morgan, chairman of the board of directors, and of President James A. Farrell and it is the first annual statement of the 27-year history of the corporation that has not borne the name of the late Chairman E. H. Gary, whose death occurred last August. The pamphlet, before taking up the year's operating results, gives prior place to the directors' memorial appreciation of their fallen leader. In commenting upon conditions in 1927 the report says that operations of the corporation averaged 78.9 per cent for the entire year. This compares with 88 per cent for 1926. During the first half of the year operations averaged 87 per cent while during the last six months the average was reduced to 70 per cent of capacity. During the year production of all the corporation's products except cement, declined and net earnings dropped to $87,896,836 compared with $116,667,404 in 1926.

The report points out that the turn in demand came in the middle of December with a substantial increase in buying and greater stability in selling prices which have continued down to base. Operations of the corporation mills during the first two months in 1928 averaged 86.5 per cent capacity. The rise in operations of the corporation mills reflects the expansion in automobile production, in the rolling of rails and in the improvement of miscellaneous demand for iron and steel products. In 1927 there was a decrease in shipments of all products except cement by 11.45 per cent. Shipping records follow:

Domestic Shipments	1927 Tons	1926 Tons
Rolled and Finished Steel Products	11,859,548	12,970,877
Pig Iron, Ingots, Ferro and Scrap	228,028	227,537
Coal, Coke and Iron Ore	564,814	1,104,191
Sundry Materials and By-Products	129,688	132,024
Total tons of all kinds of materials, except Cement	12,782,078	14,434,629
Universal Portland Cement (Bbls.)	15,261,966	15,101,788
Export Shipments		
Rolled and Finished Steel Products	1,133,735	1,327,052
Pig Iron, Ferro and Scrap	6,790	2,887
Sundry Materials and By-Products	145,571	143,400
Total tons all kinds of materials	1,286,096	1,473,339
Rolled and Finished Steel Products shipped to both Domestic and Export Trade	12,993,283	14,297,929
TOTAL VALUE OF BUSINESS (Covering all of above shipments, including cement, railroad and marine equipment delivered and other business not measured by the ton unit)		
Domestic (not including inter-company sales)	$784,453,995	$886,710,521
Export	85,781,947	100,426,645
Total	$870,235,942	$987,137,166

According to this compilation the greatest percentage decrease was suffered by the item of coal, coke and iron ore. In 1927 domestic shipments of this group of commodities totaled 564,814 tons, a decline of 48.8 per cent from the total for the preceding year. Rolled and finished steel products were shipped in the amount of 11,859,548 tons, a decline of 8.57 per cent from 1926. Export shipments of rolled and finished steel products decreased by 14.57 per cent to a total of 1,133,535 tons. Export shipments of pig iron, ferro and scrap were more than double, totaling 6790 tons compared with 2887 tons one year before. Total exports showed a decrease of 12.71 per cent while the total tonnage of rolled and finished steel products shipped to both domestic and export trades showed a decline of 9.12 per cent. Discussing the economic situation during the past year the report says:

"Conditions attending operations during 1927 were not as favorable as they were in the preceding year, yet despite the restricting influence of decreased production and lower prices, results secured were on the whole fairly satisfactory. Operating efficiency was well maintained notwithstanding during a considerable part of the year it was constantly necessary to adjust production to demand. A fair volume of demand for steel products which prevailed at the opening of the year, continued only during the first four months, following which there was a marked decline during the balance of the year.

"The lessened demand for products was accompanied by a gradual decline in prices, the price reduction being in continuance of the downward tendency which manifested itself the preceding year. As a result, in 1927 average selling price received per ton

Statistics of Steel Corporation Since Founding

Year	Gross receipts	*Net earnings	Balance capital expenditures	Production steel ingots gross tons	Production finished steel for sale, net tons	Shipments finished products, net tons	Number of employes
1927	$1,310,392,861	$172,315,489	$97,585,998	18,486,444	12,979,282	12,993,283	231,549
1926	1,508,076,090	207,345,153	76,060,520	20,306,668	14,334,412	14,297,929	253,199
1925	1,406,505,195	173,783,424	70,893,944	18,898,697	13,271,010	13,388,846	249,833
1924	1,263,711,468	161,183,467	79,619,986	16,478,857	11,722,908	11,526,890	246,753
1923	1,571,414,483	187,953,667	60,762,920	20,329,950	14,721,469	14,373,822	260,786
1922	1,092,697,772	109,788,916	23,551,991	16,082,385	11,785,331	11,911,904	214,931
1921	986,749,719	100,791,279	70,091,866	10,966,347	7,860,334	7,958,833	191,700
1920	1,755,477,025	185,095,359	102,956,133	19,277,960	14,228,502	14,098,707	267,345
1919	1,448,557,834	152,290,639	87,091,514	17,200,373	11,997,935	12,243,183	252,106
1918	1,744,312,168	208,281,104	129,855,037	19,583,493	13,849,493	14,124,986	268,710
1917	1,683,962,552	304,161,471	117,977,117	20,285,061	14,942,911	15,370,105	268,058
1916	1,231,473,779	333,574,177	64,680,648	20,910,589	15,460,792	15,542,088	252,668
1915	726,683,589	130,396,011	15,537,431	16,376,492	11,762,639	10,982,748	191,126
1914	558,414,933	71,663,615	28,171,013	11,826,476	9,014,512	9,078,559	179,353
1913	796,894,299	137,121,844	41,999,098	16,656,361	12,374,838	12,168,758	228,906
1912	745,505,515	108,174,673	13,780,361	16,901,223	12,506,619	12,696,935	221,025
1911	615,148,839	104,305,466	49,430,851	12,753,370	9,476,248	9,460,169	196,888
1910	703,961,424	101,054,754	53,101,221	14,179,369	10,733,995	10,727,751	218,435
1909	646,382,251	131,491,414	37,916,250	13,355,189	9,859,660	9,691,290	195,500
1908	482,367,840	91,847,710	49,422,697	7,838,713	6,206,832	7,102,456	165,211
1907	757,014,767	160,964,078	66,981,252	13,099,548	10,376,742	10,451,488	210,180
1906	696,756,926	156,624,273	32,155,146	13,511,149	10,578,433	10,862,425	202,457
1905	535,331,736	110,787,653	24,395,408	11,995,239	9,226,386	.....	180,158
1904	444,405,430	73,176,522	17,957,946	8,406,378	6,792,780	.....	147,343
1903	536,572,871	100,171,152	31,042,135	9,167,960	7,635,690	.....	167,709
1902	560,510,479	133,303,763	16,586,531	9,743,918	8,197,232	.....	168,127
1901	.....	84,779,293	.....	8,854,820	.....	.....	.....

*After federal taxes.

PRODUCTION
OF
RAW, SEMI-FINISHED AND FINISHED PRODUCTS BY SUBSIDIARY COMPANIES IN THE YEARS 1927 AND 1926

PRODUCTS	1927	1926	1927 Decrease	
	Tons	Tons	Tons	%
ORES MINED				
In the Lake Superior Region (*Iron Ore*)				
Missabe and Vermilion Ranges	19 298 389	22 679 710	3 381 321	14.9
Gogebic, Menominee and Marquette Ranges	2 996 493	3 088 953	92 460	3.0
In the Southern Region—Alabama (*Iron Ore*)	3 233 580	3 364 391	130 811	3.9
In Brazil, S. A. (*Manganese Ore*)	118 465	129 687	11 222	8.7
Total	25 636 927	29 262 741	3 615 814	12.4
LIMESTONE QUARRIED (*Includes Dolomite and Fluorspar*)	4 636 150	5 513 739	857 589	15.6
COAL MINED				
For use in the manufacture of coke	21 040 383	25 659 335	4 618 952	18.0
For steam, gas and all other purposes	6 389 946	8 635 322	2 245 376	26.0
Total	27 430 329	34 294 657	6 864 328	20.0
COKE MANUFACTURED				
In Bee-Hive Ovens	1 815 910	3 823 047	2 007 137	52.5
In By-Product Ovens	12 691 070	13 513 287	822 217	6.1
Total	14 506 980	17 336 334	2 829 354	16.3
BLAST FURNACE PRODUCTION				
Pig Iron	13 631 498	15 540 912	1 909 414	12.3
Spiegel, Ferromanganese and Ferrosilicon	152 728	164 389	11 661	7.1
Total	13 784 226	15 705 301	1 921 075	12.2
STEEL INGOT PRODUCTION				
Bessemer Ingots	3 706 404	4 343 788	637 384	14.7
Open Hearth Ingots	14 780 040	15 962 880	1 182 840	7.4
Total	18 486 444	20 306 668	1 820 224	9.0
ROLLED AND FINISHED STEEL PRODUCTS FOR SALE				
Steel Rails (Heavy and Light Tee and Girder)	1 482 353	1 764 589	282 236	16.0
Blooms, Billets, Slabs, Sheet and Tinplate Bars	758 847	750 137	8 710*	1.2
Plates	1 443 277	1 526 153	102 876	6.7
Heavy Structural Shapes	989 175	1 029 152	99 977	9.7
Merchant Bars, Hoops, Skelp, Light Shapes, etc.	2 426 363	2 821 093	394 730	14.0
Tubing and Pipe	1 625 994	1 690 798	64 804	3.8
Wire Rods	177 770	168 754	9 016*	5.3
Wire and Wire Products	1 259 907	1 307 099	47 192	3.6
Sheets (Black and Galvanized) and Tinplates	1 645 358	1 884 789	239 431	12.7
Finished Structural Work	553 988	615 315	61 327	10.0
Angle Splice Bars and All Other Rail Joints	273 916	313 345	39 429	12.6
Spikes, Bolts, Nuts and Rivets	63 987	73 941	9 954	13.5
Axles	50 379	84 585	34 206	40.4
Steel Car Wheels	74 868	77 317	2 419	3.1
Sundry Steel and Iron Products	233 070	227 345	5 725*	2.5
Total	12 979 282	14 334 412	1 355 130	9.5
MISCELLANEOUS PRODUCTS				
Zinc	75 974	73 730	1 344*	1.8
Sulphate of Iron	34 260	29 114	5 146*	17.7
Fertilizer—"Duplex Basic Phosphate"	11 639	21 771	10 132	46.5
Fertilizer—Sulphate of Ammonia	193 434	194 010	576	.3
Ammonia (as Liquor)	709	664	45*	6.8
Benzol Products	169 603	171 435	1 832	1.1
	Bbls.	Bbls.	Bbls.	
Universal Portland Cement	15 425 000	14 526 000	899 000*	6.2

*Increase.

of the total tonnage of rolled and other finished products shipped in that year, compared with the prices received in 1926 on an equal tonnage of similar classes of products, respectively netted $2.38 less for domestic and 81 cents per ton less for export shipments. A similar comparison for the year 1927 with 1924 shows a decrease of $6.78 per ton in respect for prices received for domestic business and $6.40 per ton for export."

It is notable that the ratio of exports of the corporation's products to its total output has been holding at a fairly stable level in recent years. In 1927 the ratio of exports to total production was about 9 per cent, a figure practically unchanged from the two preceding years. In 1924 the ratio was 10 per cent. The total value of business transacted by the corporation in 1927 was $1,310,392,861, as compared with a total of $1,508,076,090 in the preceding year. This amount represents the gross value of the commercial transactions conducted by the several subsidiary companies and includes sales made between subsidiary companies and the gross receipts of the transportation companies for services rendered both to subsidiary companies and to the public. Gross sales by manufacturing iron ore and coal and coke companies to customers outside of the United States Steel Corp. organization in 1927 stood at $870,235,942 compared with $987,137,166 in 1926, a decrease of $116,901,224 for the year. This was a decline of about 12 per cent.

The Steel Corp., like most other manufacturers of steel, failed to show an adequate return on the value of its aggregate capital investment in 1927. The showing was even less favorable than in the preceding year. The total earnings for the year after making allowances for estimated federal income tax amounted to $164,324,375 compared with $199,058,868 in the preceding year.

The decline in the balance of earnings after all charges but before dividends in 1927 compared with 1926 was 25 per cent. This compares with a falling off of shipments of less than 13 per cent. The greater decline in earnings probably is accounted for by the recessions of some 7 per cent in average iron steel prices during 1927.

During 1927 the corporation put into effect its epoch-making recapitalization program. The issued common stock was increased during the year in the amount of $203,321,000. This was the amount of stock dividend of 40 per cent declared on the common stock from undivided surplus in 1927. On Dec. 31, 1927, the issued and outstanding capital stock of the corporation was $711,623,500 of common stock and $360,281,100 of preferred stock.

During 1927 the tax burden of the corporation showed some decline chiefly due to lower federal income taxes. State and all other taxes, except federal income taxes in 1927 aggregated $34,817,116 compared with $35,313,385 in 1926. Federal income taxes

COMPARATIVE INCOME ACCOUNT

For the Fiscal Years ending December 31, 1927 and 1926

	1927	1926	+Increase —Decrease
EARNINGS—Before charging interest on Bonds and Mortgages of Subsidiary Companies:			
First Quarter	$47 610 344 88	$47 155 460 85	+ $454 884 03
Second Quarter	48 055 635 44	49 911 150 34	— 1 855 514 90
Third Quarter	43 355 091 74	54 693 856 01	— 11 338 764 27
Fourth Quarter	33 294 417 11	55 584 685 98	— 22 290 268 87
Total for year	*172 315 489 17	*207 345 153 18	— *35 029 664 01
Less, Interest on outstanding Bonds and Mortgages of the Subsidiary Companies	7 991 113 37	8 286 284 27	— 295 170 90
Balance of Earnings	164 324 375 80	199 058 868 91	— 34 734 493 11
Less, Charges and Allowances for Depletion, Depreciation and Amortization applied as follows:			
To Depletion and Depreciation Reserves of Subsidiary Companies	47 390 338 57	53 171 075 95	— 5 780 737 38
To Sinking Funds on U. S. Steel Corporation Bonds	11 515 668 84	11 049 835 37	+ 465 833 47
Net Income in the year	105 418 368 39	134 837 957 59	— 29 419 589 20
Deduct:			
Interest on U. S. Steel Corporation Bonds outstanding	16 674 175 68	17 228 669 16	— 554 493 48
Premium Paid on Bonds redeemed by Sinking Fund:			
On Subsidiary Companies Bonds	320 215 05	255 059 29	+ 65 155 76
On U. S. Steel Corporation Bonds	1 078 000 02	987 924 94	+ 90 075 08
Balance	87 345 977 64	116 366 304 20	— 29 020 326 56
Add: Net Balance of sundry receipts and charges, including adjustments of various accounts	550 858 39	301 100 69	+ 249 757 70
	87 896 836 03	116 667 404 89	— 28 770 568 86
Dividends on U. S. Steel Corporation Stocks:			
Preferred, 7%	25 219 677 00	25 219 677 00	
Common, 7%	49 813 645 00	35 581 175 00	+ 14 232 470 00
Surplus Net Income	$12 863 514 03	$55 866 552 89	— $43 003 038 86
Less, Sums appropriated and expended or to be expended account of additions, improvements or betterments to plants and property		30 000 000 00	— 30 000 000 00
Balance carried forward to Undivided Surplus	$12 863 514 03	$25 866 552 89	— $13 003 038 86

*Balance of Earnings after making allowances for estimated amount of Federal income taxes.

amounted to $11,474,242 compared with $17,086,196 in the preceding year, making a total tax of $46,291,358 compared with $52,399,581 one year before.

Expenditures during the year for general maintenance and upkeep of the property and further allowances for accruing deterioration and similar charges amounted to $117,540,174 compared with $122,910,126 in 1926. The expenditures in 1927 by the corporation and subsidiary companies for additional property, new plants, extensions, and betterments, less credit for sales of property and salvage totaled the net sum of $97,585,998. This compares with $76,060,520 in 1926 and with $70,823,994 in 1925. The large expenditure for plant improvement in 1927 is in line with the policy of the corporation to improve the operating efficiency of its plants in keeping with modern manufacturing developments. Discussing this point the report says:

"Expenditures for new installations and for diversification of products are constantly being carefully considered with the view of securing earnings results reasonably proportionate to the investment employed. The adoption of more efficient methods of production, operations and distribution call for the employment of increased capital investment with, however, a compensating return in net earning results."

Among the more important items listed by the report is the completion of the new blooming mills and special structural mill which have been in construction during the preceding two years at the Homestead works; completion of two additional merchant bar mills at the Illinois Steel Co.; conversion of the lapweld mill into a seamless mill at the Lorain works of the National Tool Co.; and an extension of the tin plate plant and an increase in capacity of the latter by about 50 per cent at the Gary works of the American Sheet & Tin plate Co.

In order to serve all mills of the subsidiaries of the corporation in the lower Monongahela valley district, Pittsburgh, there is being installed an interworks power transmission system, tying into a common service the electric power producing and distributing facilities of all plants. The cost of this, according to the report, will be large but it is expected to result in greatly economizing the production cost of power. The Carnegie Steel Co. opened a large steel storage and warehouse at Houston, Texas, during the year.

During 1927 the ingot production of the corporation totaled 18,486,444 tons compared with 20,306,668 tons in 1926 a decrease of 9 per cent. Pig iron production totaled 13,784,226 compared with 15,705,301 in the preceding year, a decline of 12.2 per cent.

The average number of employes in all companies during the year, their total salaries and wages paid as compared with 1926 follow:

	1927	1926
Employes of	Number	Number
Mfg. Prop.	167,405	183,389
Coal and Coke Prop.	21,704	25,985
Iron Ore Properties	13,261	13,283
Transportation Prop...	24,149	25,535
Miscellaneous Prop.....	5,030	5,007
Total	231,549	253,199
Total wages and salaries	$430,727,095 (March)	$467,409,446 (August)
Largest number of employes in any one month	251,778 (December)	259,600 (December)
Smallest number of employes in any one month	206,319	242,622
Average Earnings per employe per day for year:		
All employes, exclusive of General Administrative and Selling force	$5.86	$5.82
Total employes, including General Administrative and Selling force	$5.99	$5.94

The average pay roll for 1927 was $430,727,095 and showed a decrease of 7.85 per cent from the preceding year.

Pension payments made during the year to retired employes amounted to $3,003,209 compared with $2,537,916 dispersed in the preceding year. Pensions were granted during 1927 to 1175 retired employes. At the close of the year there were 6388 names on the pension rolls, a net increase of 651 during the year. The average pension of retiring employes added to the pay rolls of 1927 was $51.45 per month and their average period of service was 32.7 years. Since inauguration of the pension plan in 1911 an aggregate of $18,836,935 has been paid in pensions. The report comments that a survey made of employes one year ago showed that there were 22,994 employes who had been in continuous service of the organization for 25 years or more.

The expenditures in 1927 for installation of safety devices and appliances and in instruction of employes and proper methods of performing their duties to minimize liability and danger of injury totaled $1,271,258 compared with $1,867,324 in the preceding year. In 1927 the rate of serious and fatal accidents per 100 workers was 14.68 per cent less than in 1926 and 65.43 per cent less than in 1906, since the time safety work was inaugurated.

The rate of all disabling accidents in 1927 was 25.46 per cent less than in 1926 and 88.19 per cent less than in 1912. In 1927 the number of accidents per 100 employes was the lowest in any year since accident statistics have been compiled by the corporation.

The consolidated balance sheets of the corporation show the current assets of $533,260,106 compared with $589,598,166 one year before. There was a decrease of about $11,000,000 in inventories and $20,000,000 in cash. Current liabilities of the corporation at the close of 1927 stood at $108,922,632 compared with $121,121,925 one year before.

Sheet Sales and Output Show Gains

Pittsburgh, March 20.—Production of steel sheets at 330,565 tons, in February, by manufacturers reporting to the National Association of Sheet and Tin Plate Manufacturers, was the largest since March, 1927 and with the exception of that month and October and November, 1925, was the largest on record. On a percentage of capacity basis, however, the February figure was exceeded on several occasions in recent years.

Sales last month totaled 266,210 tons, or 79.5 per cent of the capacity of the reporting companies. This compared with January sales of 302,921 tons, or 85.7 per cent of capacity. Sales a year ago amounted to 241,951 tons.

Shipments increased from the January figure of 274,126 tons, or 77.6 per cent of capacity, to 298,420 tons last month. This represents 89.1 per cent of capacity and compares with 261,412 tons in February 1927, and 290,026 tons two years ago. February and January figures follow:

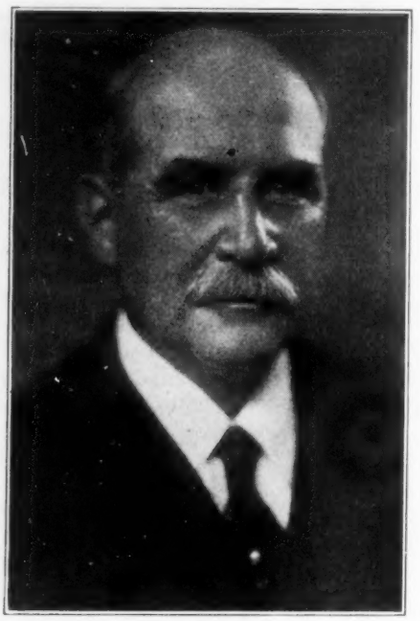
	February		January	
	Net tons	Per cent capacity	Net tons	Per cent capacity
Sales	266,210	79.5	302,921	85.7
Production	330,565	98.7	316,541	89.6
Shipments	298,420	89.1	274,126	77.6
Unfilled tonnage March 1 and Feb. 1	667,054	199.2	694,197	196.5

The total number of hot mills in the United States is 718, with a total capacity of 461,750 tons. The percentage of the capacity to which the above figures are related is 72.6. Monthly comparisons of sales, production and shipments, follow:

	Sales	Production	Shipments
January, 1927	261,357	256,856	239,019
February	241,951	282,171	261,412
March	345,900	359,340	338,436
April	292,965	316,100	300,858
May	212,337	309,360	302,759
June	224,321	300,706	281,395
July	230,715	237,243	252,034
August	177,647	266,645	266,713
September	258,427	220,919	230,443
October	234,358	245,765	232,626
November	344,519	232,041	224,789
December	530,197	260,130	221,689
January, 1928	302,921	316,541	274,126
February	266,210	330,566	298,420

Industrial Men in the Day's News

J. P. Morgan, Chairman of the United States Steel Corp.



HEAD of an internationally famous banking house for the past two decades, he has been elected to guide the destinies of the world's largest producer of steel.

FINANCIAL prestige, gained by working upward through the ranks, and capable handling of responsible war-time commissions have gained him world-wide prominence.

HIS broad smile and cheery laugh, as well as his ability to understand men, have made him countless friends. Yachting is his avowed recreation, boat racing his pleasure.

WHEN the United States Steel Corp. recently elected J. Pierpont Morgan, head of the House of Morgan, as its chairman, it chose a man whose financial genius has gained him world-wide prominence. The study of the banking industry from the lowest clerkship to the topmost position of importance, coupled with the trying war-times when his company assumed the responsible commission of financial agent for the British government, has given him extreme knowledge and sagacity of business.

Mr. Morgan was born Sept. 7, 1867, in New York. Receiving his early education at St. Paul's school, he entered Harvard university, Cambridge, Mass., and was graduated in 1889. Immediately following the completion of his college career, he became associated with Peabody & Co. in Boston and soon afterwards, with Drexel, Morgan & Co., the early name of J. P. Morgan & Co. He worked through various positions of clerk, bookkeeper, etc., and in 1894 was taken into partnership, a form of organization still adhered to by the House of Morgan.

Much of his banking knowledge was gained in London where he went in 1901, affiliating himself with J. Spencer Morgan & Co. His adeptness soon placed him in control of the company and in 1905 he returned to the United States and his father's firm.

The elder Morgan, J. P. Sr., following the return of his son, gradually withdrew from active association with the company and in 1907, J. P. Morgan Jr. took charge of the duties, becoming head of the house upon his father's death in 1913.

In 1915, when the British government made contracts with American manufacturers for munitions and arms, the House of Morgan was named agent in charge of the purchasing and financing of the supplies. The cabinet spokesman of the British parliament paid high tribute to Mr. Morgan's ability and trustworthiness, for the manner in which the responsible duties were handled. An incident, perhaps growing out of the critical war period, was the attempt at assassination of Mr. Morgan late in 1915. He was wounded by two shots fired at him in his home, but his recovery was rapid.

Mr. Morgan is a director of the International Mercantile Marine Co., the Pullman Co., First Security Co. of New York and the Aetna Insurance Co. Among his clubs are the St. James, City of London, and White's, of London; the Metropolitan, Union, University, New York Yacht, Racquet and Tennis and Harvard. As a memorial to his father, Mr. Morgan donated to a board of trustees his library collection, said to be worth $7,000,000, in addition to which he added an endowment of $1,500,000. The gift is known as the "Pierpont Morgan Library."

Mr. Morgan is a big man physically, being nearly six feet tall, and weighing 200 pounds. He resembles his father in appearance and manner, although the elder Morgan's brusqueness of voice has been replaced in the son by a cheery smile and a hearty laugh. He has understood men, chosen his associates wisely, depended upon them, confided in them and has made countless friends.

Mr. Morgan is an avowed lover of yachting. Nearly every Saturday afternoon he may be found cruising about the Sound in one of his boats. He enjoys competitive races with members of his various yachting clubs.

Mr. Morgan maintains a home at 231 Madison avenue, New York, and a country home on East Island, near Oyster Bay, Long Island.

Men of Industry

Personal News of a Business Character Pertaining to the Iron and Steel and Related Fields of Enterprise

BERTRAM W. BURTSELL has been elected president, director and general manager of Sargent & Co., New Haven, Conn., manufacturer of hardware, succeeding George Lewis Sargent, resigned. Mr. Burtsell has been president and general manager for the past eight years of McKinnon Industries Ltd., St. Catherines, Ont., and the McKinnon Dash Co., Buffalo.

* * *

Nicholas Brady of New York has been elected a director of Chrysler Corp., Detroit.

* * *

L. E. Thomas, president, Reading Iron Co., Reading, Pa., has returned from a Mediterranean cruise.

* * *

Paul Mackall, general manager of sales, Bethlehem Steel Co., is on a trip to the Hawaiian islands and Japan.

* * *

E. W. Fulton has been made general manager of the Oswego Tool Co., Oswego, N. Y., succeeding the late W. J. Henry.

* * *

T. P. Cook has been named superintendent of the newly-established branch plant of the Tri-State Culvert Co. at Atlanta, Ga.

* * *

Harry Coulby, member of Pickands, Mather & Co., Cleveland, will return to the United States from a Mediterranean tour about April 15.

* * *

A. D. Marshall and A. K. Willey have been elected assistant secretaries of the General Electric Co., Schenectady, N. Y., and will have their offices there.

* * *

H. S. Lord has been elected vice president and director of sales of Nichols & Shepard Co., Battle Creek, Mich., manufacturer of power farming machinery.

* * *

W. G. Prasse has been appointed representative for the Oilgear Co., Milwaukee, manufacturer of pumps, machine tools and power transmission equipment, for the New York district.

* * *

Robert S. Alter, vice president of the American Tool Works Co., Cincinnati, sailed recently from New York for an extended business trip in Europe.

* * *

Clarence R. Falk, secretary and treasurer of the Falk Corp., Milwaukee, manufacturer of steel castings, has been appointed general chairman of the annual campaign of the Milwaukee county community fund for 1928.

* * *

George W. Page, director of purchases for the W. A. Jones Foundry & Machine Co., Chicago, has been elected vice president of the company to succeed the late Thomas A. Jones. Mr. Page has been with the company for 30 years.

* * *

Jacob Nilson has been elected president and treasurer of the A. H. Nilson Machine Co., Bridgeport, Conn., manufacturer of wire, chain and special machinery succeeding his father, whose death was announced in IRON TRADE REVIEW Dec. 29.

* * *

Eugene W. Stern, consulting engineer in New York, has been elected vice-president of the Colonial Iron Works Co., Cleveland. He has had many years of experience in engineering construction and was at one time chief engineer of highways, of the city of New York. He will act in an advisory capacity.

* * *

Frank J. Wachter, vice president and sales manager of the cutlery division of Landers, Frary & Clark, New Britain, Conn., manufacturers of household goods, has resigned after an association with the organization for over 15 years.

* * *

N. Morton Skillin has been appointed in charge of the Boston office of the Cohoes Rolling Mill Co., Cohoes, N. Y., maker of wrought iron pipe, succeeding P. L. Watkins, transferred to Chicago, recently. For the past three years, Mr. Skillin has been with Oakes Bros., Boston.

* * *

W. W. Wilson, a banker of Milton, Pa., has been elected president of the reorganized Milton Mfg. Co., of that city, manufacturer of electric steel castings, etc., and will serve in that capacity until a new board of directors is elected by the holders of the first preferred stock. R. W. Krise continues as vice president of the company.

* * *

Willard D. Smith, vice president of the Yost Advertising Co., St. Louis, has become associated with the Monarch Metal Products Co. of that city, to be sales director of the Monarch company and the General Weatherstrip Co.

* * *

Howard Bruce, president of Bartlett-Hayward Co., Baltimore, manufacturer of grab-buckets, has been elected chairman of the company.

Howell Fisher, first vice president and manager of Bartlett-Hayward Co., succeeds Mr. Bruce. Albert C. Bruce has been elected vice president.

* * *

Stanley A. Daniels, in charge of the roll department of the Trumbull Steel Co., Warren, O., has been appointed superintendent of its hot-strip department, succeeding A. J. Schink. Mr. Daniels was at one time with the Republic Iron & Steel Co., Youngstown, O.

J. A. Lafferty, formerly with Weirton Steel Co., Weirton, W. Va., has been appointed to succeed Mr. Daniels in charge of the roll department.

* * *

George E. Ladd, for many years economic geologist of the United States bureau of public roads, has been appointed consulting geologist of the Armco Culvert Manufacturers association, with headquarters at Middletown, O. Dr. Ladd is a graduate of Harvard university, Cambridge, Mass., and became associated with the geological survey in 1897. He was appointed president of the Oklahoma school of mines and metallurgy in 1908 and to the bureau of public roads in 1917.

* * *

William L. Hoffman has been appointed Philadelphia district sales agent for the recently organized Empire Steel Corp., Mansfield, O. Mr. Hoffman for some years had been Philadelphia district representative for two of the companies involved in the mergers, Mansfield Sheet & Tin Plate Co. and Ashtabula Steel

Sheet Co. For 12 years Mr. Hoffman represented the Brier Hill Steel Co. in the Philadelphia district, and prior to that was Philadelphia manager for Hickman, Williams & Co. He had been superintendent of the open-hearth department of the old Tidewater Steel Co., Chester, Pa.

* * *

C. L. Wood, general manager of sales, Carnegie Steel Co., Pittsburgh, sailed March 17, for a European pleasure tour.

* * *

R. M. Dravo of the Dravo Contracting Co., Neville Island, Pittsburgh, and his wife left for a trip to Europe and Africa.

* * *

Minton Dammann has been elected president of American Safety Razor Co., Brooklyn, N. Y., succeeding the late Joseph Kaufman.

* * *

Willis A. Slater has been elected research professor of engineering materials and director of the Fritz engineering laboratory in the department of civil engineering at Lehigh university, Bethlehem, Pa. Mr. Slater is now engineer physicist in the bureau of standards at Washington.

* * *

G. R. White, for two years in charge of the Pittsburgh office of the Kalman Steel Co., Chicago, has been transferred to its New York office.

H. M. McGough succeeds Mr. White as manager at Pittsburgh. Mr. McGough has been affiliated with the Pittsburgh office for about three years but recently has been at Erie, Pa.

* * *

D. R. Fithian, for the past four years superintendent of the Waddell Steel Co., Niles, O., has been appointed superintendent of the Waddell works and the Falcon works of the Empire Steel Corp., both located in Niles. Mr. Fithian prior to his connection with the Waddell company was superintendent of the sheet mills of the Sharon Steel Hoop Co. at Youngstown, O.

M. A. Jones, secretary of the Waddell Steel Co. for the past four years, has been appointed chief clerk of the Niles plants of the Empire corporation. Mr. Jones was at one time assistant secretary of the Mahoning Valley Steel Co.

Pipe Questionnaires Out

Washington, March 20.—Questionnaires have been sent out by the simplified practice division, department of commerce, in connection with a revision of the simplified program for wrought iron pipe. It is understood that replies are coming in showing how the program has worked in the past year.

Beehive Coke, Soft Coal Production Gains

Production of beehive coke in the week ended March 10 was 100,000 net tons, compared with 97,000 tons in the preceding week and 196,000 tons in the corresponding week of 1927, says the federal bureau of mines. For the calendar year to date output of beehive coke is 914,000 tons, contrasted with 1,867,000 a year ago.

Bituminous coal production in the week ended March 10 was 10,422,000 tons, against 10,036,000 tons the previous week and 13,778,000 tons in the same week of 1927. For the calender year to date bituminous coal output stands at 450,291,000 tons; a year ago 561,234,000 tons.

Leads in Coking Coal

Final figures on the consumption of coal used in the manufacture of by-product coke in 1926 give the total as 64,129,000 net tons. According to the bureau of mines, Pennsylvania led with a consumption of 16,904,000 tons, Ohio was second with 10,972,000 tons. Consumption in Indiana was 7,992,000 tons, in Alabama 7,165,000 tons, in Illinois 4,690,000 tons, in New York 3,973,000 tons and in Michigan 2,573,000 tons.

The Pittsburgh Engineering Co., Jeannette, Pa., recently changed its name to the Semler Co.

Obituaries

WALTER B. LEACH, president and general manager, the Hunt-Spiller Mfg. Corp., Boston, manufacturer of castings, died at his home in Brookline, Mass., March 13. Mr. Leach was born in Boston, Aug. 30, 1870, and first went to work in the railroad shops of the Old Colony railroad and the New York & New England railroad, now a part of the New York, New Haven & Hartford railroad. He was appointed general manager and treasurer of the Hunt-Spiller Co., Feb. 1, 1904, later becoming president and general manager of the Hunt-Spiller Mfg. Corp.

* * *

Emmett C. Baxter, stove manufacturer and one time connected with the Baxter Stove Co., Mansfield, O., died in St. Petersburg, Fla., March 12.

* * *

Henry A. Runkel, 59, founder and president of the Security Lightning Rod Co., Burlington, Wis., died March 9. He was president of the Burlington National bank and served twice as mayor of Burlington.

* * *

Howard Melvin Davis, general superintendent of the Newport Rolling Mills Co., Newport, Ky., died in a Cincinnati hospital recently. Since he was 19 years old Mr. Davis had been associated with the sheet steel industry. He had been connected with the Newport company for ten years.

* * *

Dr. Thomas B. Freas, 60, inventor and manufacturer of precision apparatus and professor of chemistry at Columbia university, New York, died March 15 in that city. Dr. Freas was president of the Thermo-Electric Instrument Co., Newark, N. J., and enjoyed an international reputation as an authority on chemical thermodynamics.

* * *

Conrad Hubert, 70, credited with the original idea of the flashlight, and chairman of the board of Yale Electric Corp., New York, died March 14 at Cannes, France. He organized the Eveready Battery Co., holding its presidency until its sale to the National Carbon Co., ten years ago. Later, Mr. Hubert obtained control of the Yale corporation.

* * *

Merrill O. Steere, 81, inventor of textile machinery and in charge of the experimental department of the Wardwell Braiding Machine Co., Central Falls, R. I., died at his home at Pawtucket, R. I., recently. He owned the Springfield Narrow Fabric Co., Springfield, Mass., before entering the machine shops in Rhode Island as an inventor.

* * *

Peter J. McNamara, 77, founder and president of the McNamara-Koster Foundry Co., Indianapolis, died recently at his home. He started in the foundry business with Louis Koster in 1890. Recently Mr. Koster sold his interests to the sons of Mr. McNamara and the company was being reorganized under the name of McNamara & Sons at the time of Mr. McNamara's death.

Propose To Group Steel Orders

British Interests Find Diversity of Demands Uneconomical—Plants Busy, but Business Is Unprofitable—Entente Increases Germany's Percentage of Output—Belgian Workers' Wages Raised

European Headquarters,
IRON TRADE REVIEW,
Caxton House, Westminster, S. W.1

LONDON, March 20.—(*By Radio*)—British steelworks are busy, but diversity of specifications tends to make the work unprofitable. Some interests suggest the formation of a syndicate to provide for a better and more economical distribution of orders. Vickers Ltd., Parkgate Iron & Steel Co., and Steel, Peech & Tozer are operating at full capacity.

Good orders for galvanized sheets are coming from Argentina, Australia and South Africa. Export demand for tin plate also is improving. In the pig iron market the principal feature of the week is a general advance of 1 shilling at Middlesbrough. Orders for hematite are lacking, and two furnaces recently making this grade have been blown out. Export demand for ferromanganese is improving.

Imports of iron and steel products in February totaled 286,918 tons, compared with 283,921 tons in January and 280,520 tons in December. February exports amounted to 317,036 tons, against 332,185 tons in January and 351,795 tons in December.

The European steel entente has granted Germany a larger export percentage with a reduced penalty for excess production. The strike of metalworkers in Berlin has been settled. Belgian steelworkers' wages have just been advanced 2½ per cent. Plate users in Holland are placing good orders.

British Steel Regains Control of Home Market

BIRMINGHAM, Eng., March 5.—(*European Staff Service*)—The market shows a better tone, although it cannot be said that there is any noticeable expansion of business. The recent concessions to steelworkers in Germany and on the Continent in the matter of wages and working hours have increased costs of production and British steelmakers are now in a better position to compete against foreign material than for a long time. The decrease in imports of pig iron is noticeable, and also of semifinished steel, though these are less conspicuous. The greater activity is shown by the larger number of mills starting Sunday night

Sterling $4.88

or early Monday morning, which is taken as indicating better order books. Constructional orders, as all engineers agree, come in more regularly than a year ago, though the weights still are small. Most orders are for Indian and South American railways and some home lines. Nearly all engineers have several months work on hand, chiefly for the railways, but the amount of work given out is nothing as compared to the large requirements when the railways find themselves equal to the task.

Middlesbrough iron trade is more active, and a better tone prevails. The current make is barely sufficient to meet demand for prompt iron, and it is believed some increase will shortly be imperative. At present, fair stocks supplement furnace output. Home and Scottish consumers have transferred orders to British furnaces.

Armstrong Whitworth & Co. have secured an order for 50 locomotives for the Great Western railway and Robert Stephenson & Co. of Darlington 11 locomotives to the order of the Crown agents for the Colonies. Sheffield has had a very good series of engineering orders and is making larger demands upon the heavy

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, March 19

	British Gross Tons U. K. Ports		*French* Metric Tons Channel Ports		*Belgium and Luxemburg* Metric Tons Channel Ports		*German* Metric Tons Rotterdam or North Sea Port	
Export Prices f. o. b. Ship at Port of Dispatch—By Cable								
PIG IRON		£ s d		£ s d		£ s d		£ s d
Foundry No. 3, Silicon 2.50-3.00	$16.10	3 6 0*	$15.62	3 4 0	$15.62	3 4 0	$15.62	3 4 0
Basic	.....	.....	14.64	3 0 0	14.64	3 0 0	15.37	3 3 0
Basic-bessemer	17.08	3 10 0†	14.64	3 0 0	14.64	3 0 0	14.64	3 0 0
Hematite, Phosphorus 0.02-0.05	17.08	3 10 0	22.16	562.5*	.....	.....	$17.08	3 10 0
SEMIFINISHED STEEL								
Billets	$28.06	5 15 0	$22.81	4 13 6	$22.81	4 13 6	$22.69	4 13 0
Wire rods	47.58	9 15 0	27.45	5 12 6	27.45	5 12 6	27.08	5 11 0
FINISHED STEEL								
Standard rails	$37.82	7 15 0	$31.11	6 7 6	$31.11	6 7 6	$31.11	6 7 6
Merchant bars	1.58c	7 5 0	1.17c	5 6 0	1.17c	5 6 0	1.18c	5 7 0
Structural shapes	1.61c	7 7 6	1.05c	4 15 0	1.05c	4 15 0	1.02c	4 13 0
Plates, ship, bridge and tank	1.77c	8 2 6	1.38c	6 5 0	1.38c	6 5 0	1.38c	6 5 0
Sheets, black, 24 gage	2.40c	11 0 0	2.34c	10 12 6	2.34c	10 12 6	2.86c	13 0 0
Sheets, galvanized, 24 gage, corrugated	2.94c	13 10 0	3.30c	15 0 0	3.25c	14 15 0	3.74c	17 0 0
Bands and strips	2.29c	10 10 0	1.33c	6 1 0	1.33c	6 1 0	1.49c	6 15 0
Plain wire, base	2.12c	9 15 0	1.54c	7 0 0	1.54c	7 0 0	1.57c	7 3 0
Galvanized wire, base	2.94c	13 10 0	1.98c	9 0 0	1.98c	9 0 0	2.01c	9 3 0
Wire nails, base	2.51c	11 10 0	1.62c	7 7 6	1.62c	7 7 6	1.67c	7 12 0
Tin plate, base box 108 pounds	$4 39	0 18 0	.....	.....	.....	.....	$ 6.83	1 8 0

*Francs

Domestic Prices at Works or Furnace—Last Reported			Francs		Francs		Marks	
Foundry No. 3 Pig Iron, Silicon 2.50—3.00	$15.86	3 5 0	$17.53	445(2)	$16.46	590	$18.66	78
Basic pig iron	.....	.....	18.91	480(1)	15.48	555	21.05	88
Furnace coke	2.93	0 12 0	5.91	150	5.16	185	5.14	21.50
Billets	28.06	5 15 0	21.28	540	22.32	800	27.51	115
Standard rails	1.74c	8 0 0	1.36c	755	1.43c	1,100	1.51c	140
Merchant bars	1.63c	7 10 0	1.21c	670	1.24c	950	1.48c	137
Shapes	1.72c	7 17 6	1.12c	620	1.22c	940	1.45c	134
Plates, ship, bridge and tank	1.88c	8 12 6‡	1.40c	875	1.59c	1,220	1.65c	153
Sheets, black, 24 gage	2.51c	11 10 0	2.69c	1,495	2.50c	1,925	2.38c	220
Sheets, galvanized 24 gage, corrugated	2.94c	13 10 0	3.29c	1,825	3.80c	2,925	3.78c	350
Plain wire	2.11c	9 15 0	1.71c	950	1.82c	1,400	2.32c	215
Bands and Strips	2.29c	10 10 0	1.39c	770	1.61c	1,240	1.71c	158

*Middlesbrough; †Scotch foundry iron; ‡delivered; (1) Basic-bessemer; (2) Longwy. British export furnace coke £0 12s 0d ($2.93) f. o. b. Ferromanganese £20 10s 0d ($100.04) delivered Atlantic seaboard, duty paid. German ferromanganese £15 0s Od ($73.20) f. o. b.

The equivalent prices in American currency are in dollars per ton for pig iron, coke, semifinished steel and rails; finished steel is quoted in cents per pound and tin plate in dollars per box. British quotations are for basic open-hearth steel; French, Belgian, Luxemburg, and German are for basic-bessemer steel.

foundries. Wire rods have reduced to £7 15s ($37.82), and now make an appeal against Continental competition. Order books reflect greater activity in demand for railway material, while in the Midlands rolling stock makers are maintaining employment on a fair level, although to nothing like the extent of their capacity.

Continental billets have been further advanceed by 2s 6d ($.61) making the price £5 15s ($28.06) which is the same price as is now charged by the Ebbw Vale Coal & Iron Co., the chief source of supply to Midland rerollers, and largely contributory to the makers of sheets and tin plates. Foreign steel is increasingly squeezed out of the English market. Continental bars cost £6 10s ($31.72) delivered, an unattractive figure, and makers on the Continent require at least eight weeks to give delivery. Nearly all the sheet makers now buy British sheet bars. Various industries are taking large quantities of sheets, including the motor trade, while for galvanized sheets Britain has for many years been the source of supply. These sheets have now further increased to £13 10s ($65.88) for home and foreign customers. Good orders are still being booked by India, South America and Africa.

Some of the largest works stopped during the slump of January, and although they now have good order books, cannot restart owing to dispersal of their men.

A few sales of foreign steel are made, chiefly for fencing and nut and bolt purposes. Engineers and shipbuilders regard foreign material with disfavor for use in nut and bolt manufacture and for tube making commonly demand a certificate to the effect that the iron supplied is genuine Staffordshire puddled material. Best Staffordshire bars cost £12 10s ($61.00) and the leading works are practically fully employed, and have been for some time for such engineering and shipbuilding requirements as chain and anchor manufacture. There is keen competition in medium qualities of iron but prices are substantially the same whether in Lancashire or Staffordshire. The country merchants have lately been buying freely for renewal of their stocks. Pig iron prices are unchanged, but there is rather more buying. Northampton remains at £3 ($14.64), Derbyshire £3 4s ($15.60) and North Staffordshire £3 4s 6d ($15.72). Foreign pig irons are not called for now in any iron area.

Midland tube works are busy, and are taking large quantities of skelp bought at £11 10s ($56.12) for wrought iron and £7 15s ($37.82) for steel. Steel scrap is firm at £3 ($14.64) delivered South Wales. Welsh mills are increasing their requirements for the manufacture of tin plate and sheets.

German Iron and Steel Output Is Record

Berlin, March 5.—(*European Staff Service*)—All previous records in iron and steel production in Germany in prewar territory were beaten in January. The output of pig iron was 1,180,237 metric tons, compared with 1,149,680 tons, the previous high mark, in December, 1927. January output included 737,715 tons of basic bessemer, 227,157 tons of ferroalloys, 132,131 tons of foundry, 77,025 tons of hematite 2538 tons of direct castings, 1966 tons of acid bessemer and 1705 tons of gray forge pig iron.

Output of steel ingots and castings in January was 1,469,455 metric tons, against 1,367,684 tons in December, 1927, and 1,426,253 tons, the previous high mark, in August 1927. January output included 1,444,027 tons of steel ingots and 25,428 tons of steel castings. Ingot production was divided as follows: basic open-hearth 732,109 tons, basic bessemer 679,135 tons, crucible and electric 15,248 tons, acid open-hearth 13,815 tons and welding steel 3720 tons. The following table gives comparisons in metric tons:

Mon. ave.	Furnaces on 31st	Pig iron	Steel ingots and castings	Finished steel
*1913	.....	909,640	993,640	970,240
1925	† 83	848,060	1,016,210	853,840
1926	†109	803,625	1,028,470	856,340
1927	†116	1,091,875	1,358,780	1,069,930
1928				
Jan.	116	1,180,239	1,469,455	.....

*In present boundaries
†On last day of year.

Belgian Output Steady

Brussels, March 5.—(*European Staff Service*)—Production of pig iron in Belgium in January was slightly lower than in December, 1927. Output of steel ingots in January was 306,000 metric tons, against 301,480 tons in December, and the production of steel castings was 9650 tons in January, compared with 9210 tons in December. The following table gives comparisons in metric tons:

Mon. ave	Coke	Act. Furn.	Pig iron	Steel ingots and castings	Finished steel
1913	294,000	....	207,055	205,550	154,920
1925	342,645	....	211,875	212,380	151,215
1926	413,000	....	283,270	281,160	231,810
1927	448,880	....	312,620	309,040	255,185
1928					
Jan.	.....	55	314,580	315,650	277,870

Transport and Tariff Worry France

Office of IRON TRADE REVIEW,
9 Rue de Londres

Franc 3.93c

Paris, March 5.—(*European Staff Service*)—Several serious questions relating to the iron and steel industries were raised in France at the end of February. It will be recalled that a commercial agreement was signed with Germany in August, 1927, whereby special duties were fixed for certain iron and steel products and manufactures passing from one country into the other. It was further agreed that as from Dec. 15, 1928, Germany shall be granted the minimum tariff existing at that time in France. A tariff scheme already has been put before the chamber of deputies, but it was returned to the committee for revision. Since elections will take place this spring, and the new chamber will be busy discussing a number of bills which will take precedence over the tariff question, it is probable the present tariff will be in existence at the end of the year. It is pointed out that the present minimum tariff as applied to iron and steel products would be quite unfavorable to French industries if it were definitely applied to German iron and steel; consequently it is proposed to add a section to the agreement signed in August to modify some of the minimum duties.

Pig iron makers have been refused an increase in duties on ordinary pig iron. On the other hand, an increase is proposed for spiegel and other ferroalloys, hematite pig iron, special steel, ordinary sheets and automobile sheets. This method of dealing with the tariff question by patchwork is highly criticized in many quarters, and it is hoped that it will be possible to set up a definite tariff before the end of the year.

Another serious question is the increase of transportation rates. A general increase of 10 per cent on goods is applied by the railroad, from March 1. This increase will have an unfavorable influence on heavy products, such as iron and steel, and it is confidently expected that rebates on the base rates will be granted on those products that could not economically bear the increased burden.

The iron and steel market is firm and business is active. Export demand is increasing in volume and the trend of prices continues upward. Generally speaking, mills have heavy orders for finished steel, and deliveries extend three to four months. The fear that prices still may rise results in many orders being placed. However, it is generally felt that the price of merchant steel has reached about as high a level as is good for the market, and it is feared that if excessive quotations are reached there may be a reaction, which would prove all the more dangerous as the time of uncertainty approaches with the coming elections. Foundry pig iron now is quoted at 445 francs ($17.50), and the rise has determined a certain amount of activity in foundries.

Few steelworks are offering semi-finished steel, and the price of billets is fixed at 540 francs ($21.25), Thionville parity; this price now is fixed by the new comptoir known as the A-products comptoir and is for basic bessemer steel, an extra of 100 francs ($3.93) per ton being demanded for open-hearth steel. Beams are sold at 620 francs ($24.30). Merchant bars range from 650 to 670 francs ($25.50 to $26.30). The price of plates and sheets also is hardening. Wire products are improving.

Export prices are not fixed by the comptoir and generally follow those quoted on the Brussels exchange, the price of merchant bars now reaching £5 8s ($26.20) f. o. b. Antwerp.

Here and There in Industry

Live Information Which Records the Expansion of Various Lines of Productive Enterprise

J. L. MOTT CO. INC., Trenton, N. J., has started this year its second century of service in the production of plumbing and sanitary fixtures. The original Mott company was founded in 1828 in what is now New York and was the pioneer American manufacturer of sanitary ware. At the beginning of this year the J. L. Mott Co., New York, the Laib Co., Louisville, Ky., and the Columbia Sanitary Mfg. Co., Louisville, were merged into the J. L. Mott Co. Inc. George H. Laib is president and chairman of the board of the new company and its several subsidiaries; W. G. Probst is vice president and general manager; Jordan L. Mott III, great-great-grandson of the company's founder, is vice president and secretary and J. E. Siegel is treasurer. J. L. Mott Iron Works of New York City, sales subsidiary, will remove its offices and show rooms from Fifth avenue at Seventeenth street, to its new building at 369 Lexington avenue, corner of Forty-first street.

* * *

ACME SPRINKLER CO., Chicago, has moved from 136 West Lake street to new quarters at 173 West Madison street.

* * *

PATENT RETORTS LTD., 5 Victoria street, London, S. W. 1., has taken a contract from New Consolidated Gold Fields Ltd. for fabricating and erecting a retorting plant for treating oil shale.

* * *

PIERCE GOVERNOR CO., Anderson, Ind., is negotiating for the purchase of a plant double the size of its present quarters. Manufacture of a 2-ton gasoline-operated roller necessitates added facilities.

* * *

EAGLE TANK CO., Chicago, has moved into its new plant at 2440 North Crawford avenue. The plant is completely electric driven. New equipment for the production of wood and steel towers and tanks has been installed.

* * *

AUSTIN CO., Cleveland, is building a two-story addition to its main office building, to house its engineering department. The company will also build a woodworking shop at its Bliss Mill plant at Cleveland. This will centralize at this plant all the company's service facilities.

* * *

EDGE MOOR IRON CO., Edge Moor, Del., manufacturer of boilers, has re-elected William F. Sellers president and H. B. Bradford vice president. Owing to ill health, Mr. Sellers, who has been president for many years, relinquishes most of his duties to Mr. Bradford.

* * *

EARLE M. JORGENSEN CO., Los Angeles, jobber in steel products, has opened offices and warehouse at 568 Third street, with stocks of alloy and tool steels. J. V. Coulter, for five years with the Midvale Co. at San Francisco, has been made district manager.

* * *

REEVES BROS & CO., Birmingham, Ala., have shipped about half their contract for four 16-foot penstock pipes, each 1000 feet long, for the Saluda dam project near Columbus-Lexington, S. C. The contract requires 3250 tons of steel plate 1⅛-inch thick.

* * *

WILLIAMS & CO., Pittsburgh, sole distributor for the International Nickel Co., Pittsburgh, in western Pennsylvania, Ohio, Kentucky and part of West Virginia, have opened a warehouse at Cincinnati, with 12,000 square feet of floor space. A full stock will be carried.

* * *

SOUTHWEST PUMP & MACHINERY CO., Kansas City, Mo., formerly a partnership, has been incorporated to handle its increased volume of business. A building with twice the size of its former plant has been leased. Officers of the company are: President, O. A. Forslund; vice president, W. O. Widener; vice president, G. L. Omohundro; secretary and treasurer, H. F. Landeck.

* * *

ERECTING ENGINEERS CO., 4725 West Lake street, Chicago, manufacturer of ice machines, refrigerators and fixtures, has increased capital from $35,000 to $250,000 and has organized a subsidiary, the Sterling Fixture Co., with $50,000 capital. The former will concentrate on ice plants and refrigerating machines and the new company will take over the manufacture of fixtures in connection with refrigeration. T. A. McGurn is president and R. S. Brandt is secretary-treasurer of both companies.

* * *

MID-WEST STEEL CO., Chicago, iron and steel jobber, formerly a partnership by Albert Block and Morris Bear, has been incorporated with Sol Friedman and Paul Friedman, both of Friedman Bros. & Co. Inc., Cleveland, as president and vice president, Albert Block secretary and Morris Bear treasurer. The Chicago office of Friedman & Co. has been merged with the new corporation and offices have been established at 835 West Twenty-second street. Sheet and strip steel are warehoused.

* * *

LARKIN PACKER CO., St. Louis, has bought the property and business of the Davis Boring Tool Co. Inc., of St. Louis, which has been in receivership. The Larkin company manufactures oil well supplies. Recently it has engaged in the manufacture of expansion boring bars and cutters. It is planned to operate both plants, with the Davis company retaining its identity, as a division of the Larkin organization. General offices will be in the offices of the latter company. All cutter, boring bar and reamer production will be centered at the Davis plant and the Larkin plant will continue to engage solely in production of oil field equipment. J. J. Larkin is president and J. E. Kilzer assistant general manager of both concerns.

* * *

AMERICAN BOSCH MAGNETO CORP., Springfield, Mass., has merged its Detroit branch with the Chicago branch. Value of this arrangement has been proved in the corporation's radio division, which has covered the midwestern section for a year from Chicago. C. L. Shedd, manager of automotive general sales, western district, will continue in that capacity, taking over the Detroit territory. He was general manager of the Detroit branch for several years. Elliott S. Hanson, retiring automotive division manager of the Detroit branch, has been promoted to the general sales division of the factory at Springfield. The Detroit manufacturers' sales division will continue

to maintain its complete office and personnel at 89 Hancock avenue, West, in charge of Max Tost.

* * *

VERGAN SCHMIDT CO., formerly of Champaign, Ill., has acquired a new plant and additional production facilities at Dubuque, Iowa.

* * *

CROWE NAME PLATE & MFG. CO., 1749 Grace street, Chicago, has almost completed a 1-story addition to its plant to accommodate enlarged production.

* * *

STEWART IRON WORKS CO., Covington, Ky., has opened a district office at 215 Guaranty Bank building, Lexington, Ky., with F. A. Meyers in charge.

* * *

SUPERIOR DIE CASTING CO., Cleveland, has moved into its new plant at 875 East Seventieth street, where enlarged facilities are available.

* * *

CONSTRUCTION MATERIALS CO., Chicago, has moved its offices from the Chamber of Commerce building to larger quarters in the Builders building, 228 North LaSalle street.

* * *

COLONIAL STEEL CO., Pittsburgh, has bought a site in St. Louis and will build an office and warehouse structure. Stocks of drills will be carried for the mining and oil industries in the Southwest.

* * *

GREENVIEW MACHINE WORKS, 2557 Greenview avenue, Chicago, is building a new plant for occupancy in the fall. The company is manufacturing an automatic hoist of its own design.

* * *

PHILADELPHIA COKE CO., Philadelphia, has plans for a by-product coke plant. A permit for placing concrete piles for foundations has been issued to Koppers Construction Co., Pittsburgh.

* * *

REID & BROWN, Toronto, Ont., have bought from the harbor commissioners a site 64 x 670 feet on which a plant will be erected for the fabrication of steel for bridges and buildings.

* * *

FULTON Co., West Allis, Wis., manufacturer of automobile accessories, has established an unusual record for safety. With 47 employes operating 16 punch presses and other equipment usually rated highly dangerous, the company has covered 580 consecutive days without an accident. Complete safety appliances and safety first education are credited with this record.

* * *

STOCKER-Rumely-Wachs Co., 117 North Jefferson street, Chicago, dealer in machine tools, has added the line of lathes and shapers of the Rockford Machine Tool Co., Rockford, Ill.

* * *

ST. CLAIR FOUNDRY CO. plant at Belleville, Ill., which has been idle 18 months, has been taken over by William Kesberg and associates and will be placed in operation at once on stove plate jobbing work.

* * *

DOEHLER DIE CASTING CO., New York, has leased the nineteenth floor of a building at Fourth avenue and Twenty-seventh street, for executive offices. Its plants are at Brooklyn and Batavia, N. Y., Toledo, O., and Pottstown, Pa.

* * *

FROSENBERG Elevator Co., Milwaukee, manufacturer of hydraulic and hand-operated elevators and hoists, has established a branch office at LaCrosse, Wis., in charge of Henry Schulz, as field representative.

* * *

PROVIDENCE AUTOMATIC STAMPING CO., Providence, R. I., has contracted for the manufacture of an oil burner invented by Walter Bemis, Marlboro, Mass. Mr. Bemis becomes connected with the stamping company.

* * *

GENERAL RAILWAY SIGNAL CO., Rochester, N. Y., is completing an office building adjoining its plant, to provide larger facilities. It will include a large research laboratory and a cafeteria. Increased space for the engineering department will also be made available.

* * *

LESLIE WELDING CO., Chicago, manufacturer of wrought iron furniture and iron novelties, and jobbing welder, has completed its new plant at 2943 Carroll avenue and is established there. It is equipped to do spot and butt welding for manufacturers on a production basis.

* * *

SMALLEY CORP., Manitowoc, Wis., has been formed as successor to the Smalley Mfg. Co., manufacturer of agricultural machinery and tools. The business has been conducted for several years by a committee of creditors under management of John G. Kelley. W. R. Carr, Anderson, Ind., has bought the property and will continue operation. Frank J. Kercher, Manitowoc, is president, W. R. Carr vice president and John G. Kelley secretary and manager.

* * *

ROEPKE PAN MACHINE CO., Newark, N. J., has made plans to move its plant to Newton Falls, O. Production will be started in one unit and five others will be erected as soon as possible. The company manufactures machines for making metal pans and receptacles.

* * *

NATIONAL METAL TRADES ASSOCIATION, Worcester, Mass., branch, has elected A. C. Marble, Curtis & Marble Machine Co., president, succeeding A. Sherman Miller. John C. Spence, Norton Co., was elected vice president, Donald Tulloch secretary, and William Arter, Arter Grinding Machine Co., treasurer.

* * *

LAFAYETTE STEEL PRODUCTS INC., Lafayette, Ind., has been organized by merger of the Myers Mfg. Co., Charleston, Ill., and the Metal Basket Works, Lafayette, Ind. A plant has been bought and production is expected to start by May 1. The company will manufacture metal baskets, automobile trunks and similar products.

* * *

DeVRIES & TRINKLE INC., Philadelphia, is the new name of the former Chester Iron Works. The combpany operated as a partnership under the latter name for several months and has just been incorporated. Its product is miscellaneous iron and stair work. Edward A. DeVries is president, William Trinkle vice president, and E. E. DeVries secretary and treasurer.

* * *

ADKINS, YOUNG & ALLEN CO., 32-34 South Jefferson street, Chicago, pumps and hydraulic equipment, announces that James T. Lee and John O. Clark, of Lee & Clark Inc., Chicago, have become associated with the organization. The association of these two companies permits the combined concern to serve the trade with a complete line of centrifugal, steam and power pumps, air compressors, hydraulic equipment, plate working tools and power plant supplies. Mr. Lee formerly was vice president of Hanna Engineering Works, Chicago, and Mr. Clark was in charge of advertising and sales for the same company. They organized the firm of Lee & Clark Inc., several years ago.

Biltmore Products Inc., 2818 Fortieth avenue, Long Island City, N. Y., has filed a petition in bankruptcy. Its product is steel radiator cabinets and similar articles.

Bethlehem Earnings in 1927 Decline

Gross sales for the year of the Bethlehem Steel Corp. amounted to $271,502,891, compared with $304,361,805 for 1926. After providing $13,096,496 for depreciation and depletion, net income was $15,826,142, compared with $20,246,167 for 1926. The consolidated balance sheets as of Dec. 31, 1927, shows current assets of $152,734,606, against current liabilities of $30,471,639. Current assets include $47,796,249 in cash and United States government securities and $67,695,369 in inventories.

Unfilled orders on Dec. 31, 1927, amounted to $58,609,006, compared with $49,912,796 at the end of 1926. The value of orders booked in the year aggregated $280,199,101, against $283,707,678 for 1926. The comparative income account follows:

	1927	1926
Gross sales and earnings	$271,502,891	$304,361,805
Deduct—Manufacturing cost, administrative, selling and general expense and taxes	234,287,562	262,210,062
Net operating income	$37,215,329	$42,151,743
Add—Interest, dividends and other miscellaneous income	3,163,570	3,253,510
Total income	$40,378,899	$45,405,253
Deduct—Interest charges, including bond expense	11,456,261	12,532,421
Balance	$28,922,638	$32,872,832
Deduct—Provision for depletion, depreciation and obsolescence	13,096,496	12,626,665
Net income	$15,826,142	$20,246,167

Cash expenditures for additions and improvements to properties during the year total $30,530,306. Construction authorized and in progress at the end of the year totaled $13,850,000. The report points out that upon completion of construction now in progress Bethlehem Steel Corp. will have expended for additions and improvements to properties since Jan. 1, 1923, more than $150,000,000, principally to reduce costs of production by modernizing portions of plants recently acquired or to provide additional facilities for the manufacture of finished steel products at certain plants where existing facilities were insufficient to utilize fully the steel ingot capacities.

Bethlehem's operations averaged 73.6 per cent of capacity during 1927 as compared with 81.1 per cent in 1926. The corporation's rated steel capacity effective Jan. 1, 1928, was 7,900,000 tons. The company's comparative record of output follows:

	1927	1926
	(Gross tons)	
Ore	6,791,550	6,828,381
Limestone	1,753,153	1,722,157
Coal	7,382,626	7,295,356
Coke	4,557,923	4,964,727
Pig iron and ferro-manganese	4,315,509	4,551,353
Open hearth, bessemer and electric steel	5,590,754	6,162,759
Rolled steel and other finished products for sale	4,006,612	4,337,957

The number of stockholders at the end of the year was 60,764 as compared with 60,227 at the end of 1926. Employes totaling 10,882 were holders of record of 66,697 shares of Bethlehem preferred and 24,495 employes were paying in installments for an additional 59,689 shares under the corporation's employe saving and stock ownership plan.

The report also states that under the corporation's plan of assisting employes to acquire their own homes, a total of 4467 employes have bought homes aggregating $17,925,696. During the year $487,376 was paid in pensions. The corporation paid $111,193,699 in wages to its employes in the United States who averaged during the year 61,978. Average earnings per hour in 1927 (exclusive of general administrative and selling forces) were 63.8 cents, against 62.6 cents in 1926.

Shape Tonnage Rises in February

Washington, March 20.—Computed tonnage of structural shape orders in February totaled 270,000, making a notable gain over January, as well as February, 1927, according to statistics furnished by the department of commerce. Monthly comparisons follow:

	Actual tonnage	Per cent of capacity	Computed tonnage	Shipments computed
Total, 1926	.....	67	2,553,540	2,842,920
1927				
Feb.	197,445	69	219,420	181,260
Mar.	186,388	66	209,880	200,340
April	211,247	75	238,500	209,880
May	185,407	65	206,700	213,060
June	181,296	64	203,520	232,140
July	274,274	98	211,640	232,140
Aug.	218,181	78	248,040	260,760
Sept.	208,242	76	241,680	248,040
Oct.	229,033	83	263,940	232,140
Nov.	180,483	67	213,060	219,420
Dec.	205,165	75	238,500	225,780
Total	.....	72	2,750,700	2,626,680
*Jan.	170,829	56	210,000	210,000
**Feb.	208,241	72	270,000	232,500

*Reported by 215 firms with a capacity of 302,790 tons.

**Reported by 187 firms with a capacity of 289,010 tons.

Fuel & Iron Net Lower

Net income of $2,577,518, after all charges and income taxes but before deduction for equipment dismantled, is reported by the Colorado Fuel & Iron Co. for 1927. This compares with $2,748,415 in 1926.

Midvale Co. Earnings Up

The Midvale Co. reports for 1927 net income of $803,029 after all charges, compared with $642,462 in 1926. Net is equal to $4.01 a share on 200,000 shares of capital stock, against $3.21 a share the year before. Sales during 1927 totaled $7,727,692, against $6,878,302 in 1926, Current assets increased from $5,888,219 as of Dec. 31, 1926, to $6,598,778 at the end of last year. Current liabilities declined from $298,392 to $237,536. Surplus increased from $1,563,685 to $1,986,206.

Plane Industry May Rival Auto, Says Schwab

The history of the development of steel reveals major growth in two directions—as a substitute for other materials and in the development of new products—states Charles M. Schwab, chairman of the Bethlehem Steel Corp. and president of the American Iron and Steel institute, in a chapter on steel in the forthcoming book, "A Century of Industrial Progress." Mr. Schwab says further:

Anticipation of future changes in the demand for steel necessarily takes us into the perilous field of prophecy. The iron makers of a generation ago were accused of irresponsible optimism when they predicted what they thought would be the developments in their industry and yet in the brief time that has elapsed the industry has far surpassed their wildest expectations. Perhaps the most hopeful prophecies that we can make now will fall equally far short of reality.

It is certainly safe to predict that the requirements for construction will continue to expand since road building has yet far to go and may even involve the construction of national highways that will provide direct express communication between all important centers; the demands for bridges and vehicular tunnels are still far from satisfied, while the proposals for "Super-Cities" with multiple street levels to take care of traffic congestion are beginning to approach tangible form. Moreover it is probable that airplane manufacture will expand rapidly in the next few years, and it is even conceivable in that respect that we are at the beginning of another industry which may parallel the development of automobile making.

Iron, Steel Price Index Up in February

Washington, March 20.—The wholesale price index number for February for iron and steel was 94.9, compared with 93.9 for January and 97.7 for February of last year, taking 1926 at 100, according to the bureau of labor statistics, department of labor.

Taking metal and metal products as a whole the February wholesale index was 98.3 compared with 98.1 for January and 98 for February, 1927.

February index for nonferrous metals was 90.5 compared with 91.7 for January and 93.6 last February.

Making Production More Efficient by Machinery and Control

SEVERAL hundred engineers and others interested in the use of machine tools attended the annual machine shop practice session conducted at the Morrison hotel, Chicago, March 14, under the direction of the Chicago section of the American Society of Mechanical Engineers. The program covered a variety of shop management and manufacturing problems and proved of interest to a number of invited guests, principally members of Society of Automotive Engineers, Western Society of Engineers, Machinery club, Illinois Manufacturers association and Chicago Association of Commerce.

Five technical papers, several reels of industrial motion pictures and an open forum featured the two sessions, one in the afternoon and another in the evening. A turkey dinner preceded the evening meeting. At last year's symposium most of the papers presented were of a general nature, discussing manufacturing methods, the importance of machinery in manufacturing and means for securing economy in production. This year the papers dealt with specific problems under the same general heads.

For example, the topics of various speakers included special machinery for mass production; development of fully-inclosed gear drives for industrial speed reductions; stopping production leaks through production control; production of pressed steel frames by automatic machinery; and chromium plating. Frank W. Curtis, western editor of *American Machinist*, officiated as chairman of the meeting.

System Cuts Manufacturing Leaks to a Minimum

WITH production on the increase and with manufacturing departments distributed over a fairly widespread plant, some means often is needed for bringing together to as great an extent as possible the control and operating departments. In discussing production control systems in a paper, "Stopping Production Leaks Through a Simplified Production Control," K. R. Wood, works manager, Bell & Howell Co., Chicago, explained the operating features of a device that has aided materially in cutting operating costs.

This problem was overcome by the use of the temporator, which enables the workmen to signal job-time changes and other information direct to a central control desk so that the status of every job is known at a central point at any time during the day. With this device it has been possible to eliminate several handlings of the shop order, to cut the cost-recording force by one-half, to stop production leaks, and to avoid miscellaneous confusion.

Operating descriptions of various automatic and semi-automatic machines and devices used in connection with the manufacture of telephone apparatus were included in the paper, "Special Machines for Mass Production," of H. L. Blood, chief of machine design division, Western Electric Co., Chicago. Among these were an automatic continuous-type machine for turning rubber caps, with an explanation of how the mechanisms can be applied to ordinary turret lathes and screw machines; a semi-automatic machine for turning receiver shells; an automatic feeding device for feeding tubes into a centerless grinder; a general-purpose multiple drill with a hydraulic feed for drilling wood or metal, which contains a number of novel features; a general-purpose bench drilling machine with an indexing table; and miscellaneous punch-press operations equipped with novel mechanical features.

Progress that has been made in the design of speed reduction units, which to some extent has followed the practice adopted for that of automotive transmission, was pointed out in the paper, "Development of Fully-Enclosed Gear Drive for Industrial Speed Reduction," by J. A. Marland, engineer, W. A. Jones Foundry & Machine Co., Chicago. Such factors as compactness, reliability efficiency, production accuracy and simplicity were discussed, as well as an outline of the jigs used in manufacture, and the method of generating gear and pinion teeth from the solid steel forgings integral with the supporting shafts.

Making Automobile Frames

Of interest in connection with the paper, "Production of Automobile Frames by Automatic Machinery," by John P. Kelley, sales manager, A. O. Smith Corp., Milwaukee, was the showing of a motion picture outlining how automobile frames are fabricated automatically, starting from sheet material and passing out as a completed frame. The automatic frame plant represents the largest installation of heavy automatic machinery ever produced, and the plant has been described by numerous American and foreign engineers as one of the outstanding engineering and mechanical achievements of the world. The machinery installation includes feeding devices for transporting frame sections from one operation to another, the riveting of cross members to channels, special feeding devices, safety appliances, and many other unusual mechanisms of a startling nature.

"The Relation of Chromium Plating to Industries and the Truth About Its Value and Application," was the subject of a paper by Dr. J. Becker, chief research chemist, Vacuum Can Co., Chicago. Dr. Becker described some of the characteristics of the chromium plating process, showing how the plating is applied for appearance and wear. The three factors concerning the successful application of chromium plating, namely, the solution, the current density, and the time element, were taken up briefly. Many of the practical applications for chromium plating were discussed, these including blanking, drawing and forming dies, cutting tools, gages, bearing surfaces subjected to wear, and the salvaging of undersized material.

Dr. Becker is one of the foremost authorities on the art of chromium plating, having contributed largely to the success of the process. Not only has he been instrumental in aiding materially in devising plating methods applied to the harder-type metals, such as are used in gages, bearing surfaces and instruments, but he has also been successful in plating the softer metals such as aluminum and zinc, which heretofore has been considered an impossibility.

CONSTRUCTION and ENTERPRISE

Concise Timely Business Building Opportunities from Field of Industry

North Atlantic

NEW HAVEN, CONN.—Board of education is inquiring for woodworking and machine tool equipment for a proposed 1-story training school, 100 x 100 feet, to have an industrial shop and woodworking department.

OAKVILLE, CONN.—Smith, Seymour & Sons Inc., makers of hardware, plan to build a 2-story addition 50 x 150 feet.

BALTIMORE—Board of awards has awarded the contract for a 3-story repair shop and warehouse to be constructed at Twentieth and Curtain streets.

BALTIMORE—Virginia Barrel Co., Leadenhall and Ostend streets, is inquiring for machinery and equipment for the manufacture of steel drums for its proposed plant addition.

BALTIMORE—Acerite Steel Corp., H. J. Hahn, president, 225 West Monument street, has acquired a building at 46 South Garrison Lane and will equip it for the manufacture of special alloy castings.

BOSTON—Hub Wire Cloth & Wire Work Co., 16 Chanal street, will expand its quarters to newly leased property on Lancaster street.

BOSTON—Green Bros. & Co. Inc. have been incorporated with $50,000 in preferred shares and 500 shares no par value stock to manufacture bodies, chasses, frames, motors, etc., by Eugene E. Morton, 47 Southampton street.

BOSTON—Herbert Aucock Co. Inc. has been incorporated with $2500 in preferred shares and $7500 in common stock to manufacture automotive electrical apparatus, accessories, parts, etc., by Thomas B. Pellett, Main street, Marlboro, Mass.

FRAMINGHAM, MASS.—Butler Motor Corp., 46 Kendall street, will build a 1-story addition 60 x 100 feet to its repair and service garage.

WATERTOWN, MASS.—Peerless Pressed Metal Co., 14 Electric avenue, Brighton, plans to build a 1-story plant, 80 x 200 feet here.

WEBSTER, MASS.—Waterhouse Co., Tracy court, plans to build a 2-story automobile body manufacturing plant 60 x 90 feet.

WESTFIELD, MASS.—Barnes Airport Co. plans to build a hangar 60 x 80 feet and a machine shop 12 x 30 feet.

BOONTON, N. J.—Radio Frequency Laboratories Inc., 245 Rockaway avenue, plans to develop a new laboratory and aircraft field on property recently leased in Rockaway valley.

KEARNY, N. J.—Seaboard By-Products Coke Co. has awarded the contract for structural steel for its new building to McClintic-Marshall Co., through Cooper Construction Co.

NEWARK, N. J.—Art Metal Works plans a plant addition on adjoining property just purchased. The new property is 131 by 200 feet. Henry Baechlin will design the new building. Louis V. Aronson is president of the company.

NUTLEY, N. J.—George Swan & Co. has been incorporated with $100,000 capital to manufacture pipe and tubing by Lowy & Lowy, Newark, attorneys.

BROOKLYN, N. Y.—Transogram Co. Inc., 148 Thirty-ninth street, toy manufacturer, plans to build a 1-story and basement plant 100 x 400 feet at Haskell, N. J.

FALCONER, N. Y.—Adjustable Metal Equipment Co. has been incorporated with $250,000 capital to manufacture and deal in metal furniture by C. R. Crosby.

NEW YORK—Vulcan Architectural Iron Works has been incorporated with $5000 capital by S. L. Marcus, 277 Broadway, attorney.

NEW YORK—Art Knife Mfg. Co. has been incorporated with $10,000 capital by S. S. Burman, 2 Lafayette street, attorney.

NEW YORK—Rapid Dryer Mfg. Corp. has been incorporated with $20,000 capital to manufacture utensils, by W. M. Ziff, 443 East 138th street, attorney.

NEW YORK—Mitchell Corp. has been incorporated with $50,000 capital to manufacture and deal in machinery by R. W. Law Jr., 7 East Forty-second street, attorney.

NEW YORK—Century Brass Works has been incorporated with $25,000 capital by Van Dernoot, Meller & Cohn, 51 Chambers street, attorneys.

NEW YORK—Packard Motor Car Co. of New York, L. J. Eastman, president, will build a 14-story auto repair building, 216 x 225 feet.

NEW YORK—Gould Electric Mixer Corp. has been incorporated with $50,000 capital, to manufacture household articles, by Smith, Weinberg & Rich, 44 Court street, Brooklyn, attorneys.

NEW YORK—Atlas Mfg. Corp. has been incorporated with $10,000 in preferred shares, 100 shares no par value stock to manufacture machinery, by W. B. Dessner, 233 Broadway, attorney.

ROCHESTER, N. Y.—Peo Mfg. Co. has been incorporated with $20,000 capital to manufacture vending machines by Doyle & Corcoran, Rochester, attorneys.

ERIE, PA.—Erie Steel Barrel Co. has awarded the contract for concrete reinforcing steel for a small building to Truscon Steel Co.

ERIE, PA.—Protane Corp. has awarded the contract for a plant for the manufacture of stoves and other heating equipment, to the H. J. Conrath Co.

FORD CITY, PA.—Pittsburgh Plate Glass Co. has awarded the contract for structural steel for its polishing and grinding building, to McClintic-Marshall Co.

HAZLETON, PA.—General Aircraft Corp. has been organized to manufacture airplanes. The company has acquired the plant of the Hazleton Mfg. Co.

MONESSEN, PA.—Page Steel & Wire Co. has awarded the contract for its new laboratory building to the Westmoreland Lumber Co. The building will be 50 x 72 feet.

PHILADELPHIA—Contract for a small machine shop for the Valvoline Oil Co., Fifth and Luzerne streets, has been awarded to Wil-

(*Continued on Page* 795)

Resale Equipment News

TRUSCON Steel Co., Youngstown, O., was the only bidder at the receiver's sale of the plant and assets of the Hydraulic Steel Co., Cleveland. The bid was $1,000,000 cash, based on the company's balance sheet as of Oct. 31, 1927. The Hydraulic company has been in receivership since Oct. 16, 1923. After changes in the plant Truscon will operate it in the manufacture of pressed steel products. Court approval of this bid is expected. It will yield stockholders about 70 cents on the dollar.

* * *

Machinery, equipment and assets of the Brown Auto Carriage Co., Cleveland, will be sold at public auction March 23 by Gus Rosen, auctioneer. Tools include vertical drill press, tools, bolts, forge and anvil, springs, stoves, gas heaters, power press, reflectors, pulleys, hangers, belting, motor and other equipment.

* * *

Sale of machinery and equipment of Electric Commercial Truck Co., Philadelphia, announced for March 19 and 20, has been postponed by order of the receivers.

Sales Calendar

April 3—Plant and equipment of Bilton Machine & Tool Co., Bridgeport, Conn., to be sold at public auction by the receiver.

April 10—Auction of land, buildings and equipment of William Hamilton & Sons Car Co., Newark, O.

Machinery

March Business Thus Far Somewhat in Excess of Same Period in February—Orders Small but Numerous—Crane Sales Light

ALTHOUGH no definite or extensive buying movement has come to the front during the week, purchases of machine tools and shop equipment have made some improvement and present indications point to a satisfactory month in March. Orders for the most part are for one or two machines, but the number of orders has increased. Buying may be described as general, although the automotive field is participating to a small degree. Several railroads have made purchases or have issued moderate inquiries. Farm equipment manufacturers are preparing for spring needs. The second quarter list of Westinghouse Electric & Mfg. Co., just announced, is small and said to be the poorest in eight years. Used machinery enjoys good demand and moves quickly.

New York, March 20.—A moderately good volume of machine tool buying is reported here. A recent buyer of five or six heavy machine tools is the Pan-American Petroleum Co., for export. The Atlantic & West Point has closed on a 48-inch, 50-ton wheel press and an axle lathe and the Central of Georgia on a similar sized wheel press, both orders going to the Niles Tool Works. The Western Railroad of Alabama has purchased a 13 by 30-inch lathe and the Merchants Dispatch a die sinker, both orders going to the Pratt & Whitney Co. This latter builder also has received a sizable order from a company in Indiana, comprising six vertical shapers, one 13 by 30-inch engine lathe, one 16 by 36-inch engine lathe, one 20 by 48-inch lathe and one jig borer. A 3½-foot heavy-duty radial drill has been sold to the Harrisburg Light & Power Co., Harrisburg, Pa., and three United States pedestal tool grinders to Pratt & Whitney Aircraft Co., Hartford, Conn. Crane buying has been confined largely to a fair number of locomotive cranes. While a substantial number of overhead cranes are being figured, orders for this type of equipment continue to come through slowly.

Worcester, Mass., March 20.—With the exception of most of the makers of textile machinery, machine tool manufacturers are doing a fair volume of business. Equipment for a large central western steel interest was placed with a local company last week. Sales of individual units continue brisk. The automotive trade is also asking for more tools, replacements in some instances. This total is larger than expected and satisfactory. Grinding machinery orders are running well ahead of last year and inquiries show an improvement. Automatic production machine tools are moving steadily. Wire mill and other steel works machinery is also in good demand. Most machine tool makers report business well in advance of last year. Textile machine makers are the exception, especially in reporting lack of unit installations, but demand for parts indicates machinery in operation will need replacement before long. Small tools are selling fairly well, but buyers are taking small lots.

Pittsburgh, March 20.—Purchases by the National Transit Pump & Machine Co., Oil City, Pa., and the issuance of its second quarter list by Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., last Friday furnish the machine tool market with at least two important features. The National company's order involved several items, including three lathes, two radials, two boring mills and one milling machine. Other sales have been confined to single items. The Westinghouse list again is disappointing; in fact, one dealer pronounced it the poorest list in about eight years, one of the most important items being a turret lathe. Another local manufacturer is inquiring for three drills and numerous single tool inquiries are before the trade. American Rolling Mill Co., about to add to its mill equipment at Butler, Pa., states that present machine tool equipment is adequate. Bessemer & Lake Erie railroad has again withdrawn its list for Albion, Pa. Conflicting reports are current with regard to the rebuilding of the shops at Connellsville, Pa., by the Baltimore & Ohio railroad—one announcement says that the new shops will be on a smaller scale and another that instead of 35 locomotive stalls as before the fire. arrangements will be made for 60 in the new shops.

Crane awards since the McClintic-Marshall Co. and the Westinghouse Electric & Mfg. Co. bought, have been practically nil.

Chicago, March 20.—Fresh inquiry for machine tools is somewhat lighter in the immediate Chicago district and the volume of business closed is slightly under the similar period last month. The unfavorable situation as compared with last month is due in a measure to the absence of important railroad inquiry, which had been expected to develop during March. The Burlington has asked bids on several welding machines and grinders, and the inquiry for shapers for this road, which has been before the trade for some time now, is becoming active. Indications are that the Santa Fe will not start buying against its list for at least a week. The inquiry of the Duluth, Missabe & Northern for a tool lathe, electric flue welder and several other machines has become more active also. International Harvester Co. has bought several screw machines, hydraulic equipment and other machine tools for its West Pullman, Ill., works, and John Deere & Co. has ordered some machines for its Waterloo, Iowa, plant. Buying of equipment by the farm implement concerns has been an active feature of the market. Used tool inquiry is active.

Cleveland, March 20.—Sales in this territory have improved somewhat during the past week, giving rise to the belief that March will prove a better selling month than February. One or two units constitute an order but orders are more numerous. The automotive interests in Detroit as well as Cleveland are practically out of the market for the time being. Used equipment is selling well. Dealers who have machines in stock are finding a good number of spot transactions. Delivery from the factory is about two weeks and many purchasers do not care to wait that long.

CRANE ORDERS PLACED

Two 15-ton crawler cranes for Robins Dry Dock Co., Brooklyn, N. Y., to Harnischfeger Corp.

Among single orders were: 10-ton crawler crane for W. S. McDowell Co., Chester, Pa., to Thew Shovel Co.; 12-ton crawler crane for the Frederick Snare Corp., New York, for shipment to Peru, to Koehing Crane Co.; 25-ton rebuilt locomotive crane for New Jersey Sand & Gravel Co., Asbury Park, N. J., to unnamed seller; 4-ton special electric crane for Advance Bag & Paper Co., Boston, to Armington Engineering Co.; ½-yard crawler crane for Frank Battaglia & Sons, Fairview, N. J., to Orton Crane & Shovel Co., New Haven, Conn., to the Harnischfeger Corp.; 40-ton crane for installation in a plant of Glenwood Power Co., Glenn Landing, Long Island, through E. L. Phillips, New York, to Cleveland Crane & Engineering Co.

CRANE ORDERS PENDING

Eight cranes for Wheeling Steel Corp., Steubenville, O.; bids being compiled.

Six cranes for Pittsburgh Plate Glass Co., Ford City, Pa.; bids being taken.

Two 15-ton cranes for Carnegie Steel Co., Duquesne, Pa.; bids being taken.

Cranes for Weirton Steel Co., Weirton, W. Va.; bids being compiled.

Grab bucket cranes for Koppers Co., different destinations; bids being taken.

Fix Basis for Pipe Duty

Washington, March 20.—To ascertain the dutiable value of certain cast iron pipe imported into Porto Rico judges of the United States court of customs appeals have ruled that the following charges should be deducted from the export value: Transportation from factory to Antwerp, ocean freight, insurance, consular fee and transmission tax.

From 1901 to 1926 the consumption gas in the United States has increased from 85 billion cubic feet to 457 billions.

Iron and Manganese Ores and Minerals

Iron Ore

LAKE SUPERIOR ORES

Per Gross Ton, Lower Lake Ports

Old range bessemer, 51½ per cent iron	$4.55
Mesabi bessemer, 51½ per cent iron	4.40
Old range nonbessemer, 51½ per cent iron	4.40
Mesabi nonbessemer, 51½ per cent iron	4.25

EASTERN LOCAL ORES

Cents per unit delivered at Eastern Pennsylvania and New Jersey furnaces

Foundry and basic 58 to 63 per cent	8.00 to 8.50
Copper free low phosphorus 58 to 65 per cent	nominal

FOREIGN IRON ORE

Cents per unit, alongside docks, Atlantic ports

Foreign manganiferous ore, 45 to 55 per cent iron and 6 to 8 per cent manganese	10.00 to 10.50
North African low phosphorus	nominal
Swedish foundry or basic, 65 per cent	9.00 to 9.50
Spanish and North African basic, 50 to 60 per cent	8.50 to 9.00
Newfoundland foundry, 55 per cent	9.00 to 9.50

Manganese Ore

Prices do not include duty at rate of 1 cent per pound of metallic manganese contained.

Brazilian	36 to 38 cents
Indian	36 to 38 cents
Caucasian, 53 to 55 per cent washed	38 to 40 cents

Fluorspar

85 and 5 per cent grade

Washed gravel, Kentucky and Illinois mines, per net ton	$14.50 to 15.00
Washed gravel, imported duty paid eastern tidewater, per net ton	15.50 to 16.00

Construction and Enterprise

(*Continued from Page* 793)

liam C. Wright & Son, 22 Harvey street.

PHILADELPHIA—Philadelphia Electric Co., 1000 Chestnut street, has started work on a substation in West Moreland street, east of Hunting park. John T. Windrim prepared the plans.

PITTSBURGH—B. H. Prack, Martin building, architect, will receive bids for a 1-story plant addition for Lawson Mfg. Co., 300 Lexington avenue, manufacturer of gas burners and water heaters.

SILVER BROOK, PA.—Haddock Mining Co. plans to make extensions and improvements in its machine repair shops.

VERONA, PA.—Allegheny Metal Products Co., P. C. Gasparin, 1902 Brighton road, president, will remodel a building to be used for a new plant.

East Central

BELLEVILLE, ILL.—Harrison Machine Works, 1510 East Main street, has been incorporated with $50,000 capital to manufacture and deal in grain threshers, balers, etc., by Lee Harrison Jr., A. S. Peters and H. J. Schoelkopf.

BLOOMINGTON, ILL.—Hayes-Custer Stove & Furnace Co., manufacturer of stoves, castings, etc., recently has completed a building 60 x 160 feet, to house its sheet metal department, for which complete equipment has been purchased. Another building, 60 x 110 feet, is now under construction for a porcelain enamel plant. A 50 x 100-foot addition to its foundry will be started within the next 30 days. No new equipment will be required for any of the new construction. (Noted March 15.)

CHICAGO—Detex Watchclock Corp., 4147 Ravenswood avenue, plans to rebuild that part of its plant burned in a recent fire.

CHICAGO—The plant of Hardinge Bros. Inc., was damaged by fire March 7. The company manufactures machine tools at 4147 Ravenswood avenue.

CHICAGO—Electric Co., 4750 Sheridan road, has been incorporated with $10,000 capital to manufacture and deal in electrical appliances by J. D. Kerler, C. J. Schmidt and E. J. Kerler.

CHICAGO—Chicago Pipe Co., 836-40 West Kinzie street, has been incorporated with $10,000 capital to manufacture and deal in plumbing supplies and metal products by E. C. Shilvock, R. D. Kyle and G. H. Kyle.

CHICAGO—Coin Covenant Corp., 105 West Adams street, has been incorporated with $30,000 capital to manufacture and deal in coin banks, home savings banks, etc., by Adam D. Blocker, R. Y. Ellis and C. B. Bissell.

CHICAGO—Ives Engineering Co., 75 East Wacker drive, has been incorporated with $50,000 capital to design and draw machinery and apparatus, by Clifford E. Ives, George E. Mueller and E. F. Stern.

CHICAGO—John Peterson & Co., 15 South Racine street, has been incorporated with $50,000 capital to manufacture and deal in furniture, railway fixtures, etc., by John Peterson, Gotfried Buland and Kenneth G. Meyer.

CHICAGO—Middle West Instrument Co., 1870 Ogden avenue, has been incorporated with $10,000 capital to manufacture and deal in scientific laboratory and other apparatus, by Victor P. Frank, Harry M. Jones and Albert R. Nechin.

CHICAGO—Hammond Clock Co., 215 North Michigan avenue, has been incorporated with $25,000 in preferred shares and 1000 shares no par value stock to manufacture and deal in electrical and chemical devices by Laurens Hammond, L. W. Scudder and E. F. Andrews.

CHICAGO—Roax Mfg. Co., 3149 Clifton avenue has been incorporated with $12,000 capital to manufacture and deal in manufacturers' and mill supplies, engines, etc., by Joseph L. Rosenthal, Rose Axelrad and M. G. Hattie.

CHICAGO—Mall Tool Co., 7740 South Chicago avenue, A. W. Mall, president, will build a 1 and 2-story plant.

EAST ST. LOUIS, ILL.—Park Airline Co., H. P. Mammen, president, Missouri theater building, plans to build an airplane plant.

ELGIN, ILL.—Fox Electrical Supply Co., 67 North State street, has been incorporated with $10,000 capital to manufacture and deal in electrical machinery and supplies by A. L. Paulson, A. A. and E. E. Hasselquist.

MATTOON, ILL.—Ellison & Ellison Inc., 208 South Seventeenth street, has been incorporated with $15,000 capital to manufacture and deal in oil burners, heaters and equipment by W. A. Laura, Arthur and A. T. Ellison.

OTTAWA, ILL.—National Plate Glass Co., subsidiary of General Motors Corp., has awarded the structural steel contract for its Fisher body plants, to Mississippi Valley Structural Steel Co. (Noted March 8.)

TAMAROA, ILL.—Electric Radiator Co. has been incorporated with 500 shares no par value stock to manufacture and deal in electrical machinery and chemical industrial merchandise by H. B. Haines, J. D. Byrne and G. H. Collins.

ANDERSON, IND.—Delco-Remy Corp. has completed plans for the construction of a new unit 243 x 300 feet, where parts for the starter department and the box making department will be located. A new foundry may be added this year, F. C. Kroeger, manager, has announced.

INDIANAPOLIS—Constant Clean Mfg. Co. has been incorporated with $10,000 capital to manufacture cleaning, washing and drying equipment by Anna L., Martha L. and James C. Gipe.

LAFAYETTE, IND.—Steel Products Inc., formed by the consolidation of the Metal Basket Works, Lafayette, and Myers Mfg. Co., Charleston, Ill., incorporated with $375,000 capital, has purchased the Indiana Wagon Works building here and expects to start production of metal baskets, automobile extension trunks, etc., by May 1.

MUNCIE, IND.—Delco-Remy Corp. will establish a storage battery plant in the old Durant plant, acquired recently by the Delco-Remy interests.

SOUTH BEND, IND.—Max Schneider Co. has been incorporated with 1000 shares no par value stock to deal, smelt and refine metals, by Max Schneider, Eli Fink and Hannah Fink.

ADRIAN, MICH.—Kewaunee Mfg. Co. is in-

quiring for machinery and equipment for the manufacture of laboratory furnishings and furniture, for its new 2-story plant, 50 x 100 feet.

BUCHANAN, MICH.—Clark Equipment Co., manufacturer of auto wheels, axles, etc., is building three new plant units as a part of its expansion program.

DETROIT—Electric Sprayitt Co., 217 Iron street, is inquiring for turret lathes of various specifications.

DETROIT—Bowler Roller Bearing Co., 3040 Hart avenue, is inquiring for machine shop equipment, including grinder, etc.

DETROIT—Wise Chrome Products Co., 2474 Bellevue avenue, manufacturer of metal products, plans to build a 1 and 2-story plant, 72 x 133 feet.

DETROIT—Detroit Show Case Co., Herbert Malott, 1654 West Fort street, secretary and treasurer, plans to build a 2-story top addition to its plant.

GRAND RAPIDS, MICH.—New Era Spring & Specialty Co. will devote a part of its plant to the output of a newly developed pneumatic bumper.

HIGHLAND PARK, MICH.—Chrysler Corp., 341 Massachusetts avenue, has awarded the contract for a 1 and 2-story body receiving and storage building, 83 x 580 feet.

NILES, MICH.—Kompass & Stoll Co. has awarded the contract for a 2-story plant 60 x 100 feet for the manufacture of kitchen cabinets.

CANTON, O.—Hercules Motor Corp., manufacturer of internal combustion engines, plans to rebuild a 1-story plant 75 x 125 feet, burned recently.

CLEVELAND—National Library Bindery has awarded the contract for a plant to be built in East Cleveland, to the Austin Co., local builder.

CLEVELAND—Cleveland railway has awarded the contract for a 3-story motor bus garage and service station, 100 x 125 feet, to be built at East Ninth street, on Central avenue, to the Austin Co., local builder.

EAST LIVERPOOL, O.—Ludlow Window Ventilator Co. expects to start production soon on its patented window ventilator in the Milliron building.

GALION, O.—Central Ohio Steel Products Co., recently incorporated, has purchased the plants and business of the Galion All-Steel Body Co. and the National Grave Vault Co. The company will continue the business and contemplates future expansion. (Noted March 15.)

SALEM, O.—National Sanitary Co. has awarded the contract for a new plant to the Boyd-Meinhart Construction Co., Massillon, O. The new plant will replace the one burned in a fire recently. (Noted Feb. 9.)

TOLEDO, O.—Willys-Overland Co., manufacturer of automobiles, has awarded the contract for concrete reinforcing steel for its stock and export building to Building Products Co., through Henry J. Spieker Co., general contractor.

WHEELING, W. VA.—Wheeling Steel Corp. has awarded the structural steel contract for its new plant at Steubenville, O., to the J. E. Moss Iron Works.

MILWAUKEE—Western Metal Specialty Co., manufacturer of sheet metal parts for automobiles, is building a plant addition and installing additional machinery and equipment.

MILWAUKEE—A charter has been granted to the Bassler Pipe Threading Co., 1207 Thirtieth street, to manufacture machinery and products pertaining to nipple threading. Capital stock is $20,000 and the incorporators are Guy E. Bassler, Harry A. Connell and Walter F. Bassler.

MILWAUKEE—Allen-Bradley Co., 494 Reed street, is now taking bids for the construction of a furnace house and substation, 44 x 140 feet, 1 and 2 stories. The work is in charge of Architect Fitzhugh Scott, 214 Mason street. The company manufactures electric controlling devices, radio specialties, etc.

STEVENS POINT, WIS.—Division headquarters of the Soo line will install a new turntable.

WAUKESHA, WIS.—L. F. Schroeder Construction Co., Fond du Lac, Wis., is successful bidder for the general contract on a new manufacturing plant for the Palmer Products Co. Inc., maker of janitors' supplies, 54 Third street, Milwaukee. It will be 1-story, 80 x 190 feet.

Southern States

BIRMINGHAM, ALA.—National Cast Iron Pipe Co. has awarded the contract for structural steel for a plant addition, to the Virginia Bridge & Iron Co.

ATLANTA, GA.—Tri-State Culvert Co. has opened a branch plant here at 880 Glenwood avenue for the manufacture of metal culverts. T. P. Cook is superintendent of the plant.

WINSTON-SALEM, N. C.—Southern Metal Products Co., J. E. Vanhorn, manager, is building a new plant 40 x 76 feet on Walkertown road.

GREENWOOD, S. C.—Aldrich Machine Works plans to rebuild the part of its plant burned recently.

DALLAS, TEX.—Southern Ornamental Iron Works, 2425 South Horwood street, has awarded the steel contract for its plant to Austin Bros., 1815 Coombs street. (Noted Feb. 23.)

DALLAS, TEX.—Tridex Cleaning Co. has been organized to manufacture and deal in an automobile cleaning machine by W. P. Gage, Stoneleigh street. The machine will be manufactured by Guiberson Corp., on a quantity basis.

HOUSTON, TEX.—Southern Pacific railroad plans to build extensions and make improvements in its car shops at Jacksonville, Tex.

SAN ANGELO, TEX.—Western Mfg. Co. has been incorporated with $100,000 capital, by B. W. and M. S. Willig and E. E. Barth. The name of the company has been changed from Western Iron Works. Four new buildings are planned, including a sheet iron plant, machine shops, woodworking and assembling department, 40 x 270 feet; blacksmith shop, 40 x 40 feet; foundry, 30 x 100 feet.

Refractories

FIRE CLAY BRICK
Per 1000 f.o.b. works

First Quality	
Pennsylvania	$43.00 to 46.00
Ohio	43.00 to 46.00
Illinois	43.00 to 46.00
Kentucky	43.00 to 46.00
Missouri	43.00 to 46.00
Maryland	43.00 to 46.00
Georgia and Alabama	40.00 to 45.00
Second Quality	
Pennsylvania	35.00 to 38.00
Ohio	35.00 to 38.00
Illinois	35.00 to 38.00
Kentucky	35.00 to 38.00
Missouri	35.00 to 38.00
Maryland	35.00 to 38.00
Georgia and Alabama	30.00 to 35.00

SILICA BRICK

Pennsylvania	43.00
Joliet, Ill., and East Chicago, Ind.	52.00
Birmingham	51.00

MAGNESITE BRICK
Per Net Ton

9 x 4½ x 2½	65.00

MAGNESITE

Per Net Ton Chester, Pa. and Baltimore base	
Dead-burned grain magnesite	40.00

CHROME BRICK

Per Net Ton Chester, Pa., and Baltimore base	
9 x 4½ x 2½	45.00

Western States

LOS ANGELES—Concrete Machinery & Supply Co. has awarded the contract for a 2-story plant 85 x 125 feet to the Austin Co. of California. The company manufactures industrial engines and machinery.

SAN FRANCISCO—Pacific Can Co., 290 Division street, has work under way on its new 1-story plant. (Noted Feb. 16.)

PORTLAND, OREG.—Club Aluminum Co., Chicago, will install a branch plant in the Fitzpatrick building, space already having been leased.

SALEM, OREG.—Salem Iron Works will install additional machinery to provide for the manufacture of paper mill specialties and other machinery. A. B. McLaughlin is superintendent of the company.

SEATTLE—Nepage-McKenny Co., electrical engineer and manufacturer will build a new plant for the production of electrical equipment.

SEATTLE—Kendall-Hazlett Battery Mfg. Co., 546 Skinner building, plans to build a 1-story plant for the manufacture of electric storage batteries.

VANCOUVER, WASH.—Webber Machine

Works will build a machine shop, 50 x 80 feet, adjoining its present plant units.

SACKVILLE, N. B.—Enamel & Heating Products Ltd. has been incorporated to manufacture and deal in metal products, including the work of enameling and brass finishing, with 50,000 shares of no par value stock by Francis G. Bush, Herbert W. Jackson and Alexander G. Yeoman.

BRANTFORD, ONT.—Crown Electric Mfg. Co. Ltd. has been incorporated to manufacture and deal in electrical appliances with $200,000 capital and 400 shares no par value stock by Joseph Ruddy, John Dowling and Arthur B. Burnley.

GRIMSBY, ONT.—Grimsby Foundry Co. Ltd., 23 John street, is planning an addition to its foundry.

GUELPH, ONT.—Commercial Motor Bodies & Carriages Ltd., Woolwich street, plans the erection of an addition to its plant here to be a 3-story building, 40 x 40 feet.

HAILEYBURY, ONT.—Prospectors Airways Ltd. has been incorporated to manufacture and deal in airplanes, airships, etc., with $50,000 capital by Clarence E. Tuer, Gordon F. Summers, and Reuben Y. Campbell.

HAMILTON, ONT.—Construction Products Ltd. has been incorporated to manufacture and deal in builders' and constructors' supplies with $100,000 capital by Robert R. Evans, Henry A. Burbidge and John D. Scott.

HAMILTON, ONT.—Hamilton Bridge Co. has been incorporated to manufacture and deal in bridges and structural steel work with $5,800,000 capital and 100,000 shares no par value stock by Rufus C. Holden, Paul P. Hutchison and Frederick T. Collins.

PEMBROKE, ONT.—The carriage plant owned by Alexander Carr was damaged by fire recently.

PORT ARTHUR, ONT.—Department of public utilities is making arrangements for the construction of an addition to its power plant at Water and Cameron streets.

SCARBORO, ONT.—Cairns Bros. Ltd. has been incorporated to carry on the business of contractor and manufacturer of building materials, with $100,000 capital by Thomas C. Urquhart, George A. Urquhart and Harold M. Smith.

TORONTO, ONT.—Canadian Wirebound Boxes Ltd., 1000 Gerrard street east, plans to build a 1-story plant and warehouse. The architect is not selected as yet.

TORONTO, ONT.—Sully Brass Foundry Ltd., 2388 Dundas west, has purchased the foundry building on the South side of Wabash avenue, which will be equipped for a brass foundry.

TORONTO, ONT.—W. E. Dillon Co. Ltd., 191 George street, manufacturer of sheet metal products, etc., will build a 2-story addition to plant here, 35 x 56 feet, brick construction.

TORONTO, ONT.—Dominion Cutout Co. Ltd. has been incorporated to manufacture and deal in electrical appliances and supplies, with 500 shares no par value stock by George A. Kingstone, James R. Tate and Thomas McMillen.

TORONTO, ONT.—A. Mason, 130 McRoberts avenue, has let contract to W. H. Little, 63 Edna avenue, for the erection of a 1-story foundry, 80 x 200 feet, on Brandon avenue near Dufferin street. Machinery and tools for the proposed plant will be purchased.

TORONTO, ONT.—Canadian Norfolk Essex Tobacco Co. Ltd. has been incorporated to manufacture tobacco, and tobacco manufacturing machinery, with $1,800,000 capital and 200,000 shares no par value stock by Roland O. Daly, Harold E. Manning and Earl E. Thistle.

TORONTO, ONT.—McGregor-McIntyre Structural Steel Ltd. has been incorporated to manufacture and deal in steel and iron plates and metal products, with $200,000 capital and 10,000 shares no par value stock, by William E. Sommerville, Arthur W. Holmested, and Leonard V. Sutton.

WINDSOR, ONT.—T. J. Eansor & Sons Ltd. has been incorporated to carry on the business of iron founder and manufacturer of machinery, with $150,000 capital by Thomas J. Eansor, William J. Eansor, and Norman D. Eansor.

LORETTEVILLE, QUE.—Municipal council, E. A. Martel, secretary, has had plans prepared by engineers, Langlais, Ricard & Royer, 126 St. Peter street, Quebec, Que., for waterworks and sewage plants.

MONTREAL, QUE.—Pulp Bleaching Ltd. has been incorporated to manufacture and deal in machinery, engines, and power plant equipment with 5000 shares no par value stock by John A. Mann, Cecil G. Mackimmon and Paul Galt.

MONTREAL, QUE.—Par Tex Foundation Co. Ltd. has been incorporated to carry on business of contractor and manufacturer of builders' materials, with 25,000 shares of no par value stock by Gilles Gadbois, Alfred Tourigny and Paul H. Fortier.

MONTREAL, QUE.—Ransome & Marles Bearing Co. of Canada Ltd. has been incorporated to manufacture and deal in engine boilers, power plant equipment, etc., with $50,000 capital by Charles A. Hall, Shirley G. Dixon and Adrey M. G. Carter.

ST. THERESE, QUE.—Willis & Co. Ltd., 580 St. Catharine street west, Montreal, proposes building addition to its plant here for the manufacture of player pianos, musical instruments, etc.

REGINA, SASK.—Stephen Motor & Aero Co. Ltd. has been incorporated to manufacture and deal in airplanes, airships, etc., with $100,000 capital by Franklin G. Stephen, Reginald Morrow and Harvey A. Stephen.

New Trade Publications

SLEEVE JOINTS—Semet-Solvay Engineering Corp., New York, has issued a bulletin describing welded sleeve joints for use in steel pipe, for rapid fabrication, tight joints and other advantages.

ELECTRIC MOTORS—Lincoln Electric Co., Cleveland, has issued a booklet describing its motor, in which welded steel is used in many parts. Illustrations cover details of construction and phantom view discloses all parts. Text gives full description of the motor and its operation.

MANGANESE BRONZE—Niagara Falls Smelting & Refining Corp., Buffalo, is issuing a booklet on how to make manganese bronze. Use of the company's manganese bronze hardener is suggested and formulas for various analyses are given, to produce bronzes to meet various tests.

TURRET LATHE—Six closeup views of as many successive positions in machining a steel part are shown in a folder issued by the Jones & Lamson Machine Co., Springfield, Vt. This is the next thing to seeing the machine in operation and finishing the work on one of the company's lathes.

ELECTRIC METER—A new type of electric meter, designed for close accuracy, is featured in a bulletin by the Sangamo Electric Co., Springfield, Ill. Ample illustrations supplement the text and changes from previous models, to attain closer accuracy, are described fully. A table of train ratios and disk constants is included.

REFRACTORY LINING—General Refractories Co., Philadelphia, in a current folder, presents the experience of a cement maker in the use of its high alumina brick as lining for cement kilns. The linings gave many times the length of service obtained previously and replacements promise to equal the original performance.

ACETYLENE—International Acetylene association, New York, has issued a booklet on the relative value of acetylene and city gas as fuels for cutting iron and steel with oxygen. It covers the subject from the standpoints of theory and practice and gives much information of value to users of the cutting flame.

WELDING—A bulletin by the Wilson Welder & Metals Co., Hoboken, N. J., describes essentials of good welding, as set forth by the technical director of the company. The material is the result of research by the attorney in this field, in perfecting its welding devices. Drawings illustrate the text. Data are given to guide the welder in choice of current value, proper electrode and other factors.

ROLLER BEARINGS—International Nickel Co., New York, in a current bulletin presents information on roller bearings in railroad service. It is based on performance of equipment in use for some time. Another bulletin by the same company gives details of construction of nickel alloy steel roller bearings carrying heavy loads at high speeds, with tables showing physical properties required of the materials used to meet this severe stress.

LEAD-COATED SHEETS—Superior Sheet Steel Co., Canton, O., has issued a bulletin on its lead-coated sheet steel for outside work, roofing, siding, conductor pipe and similar uses. The advantages of lead in cheaper form is claimed. The bulletin contains information as to sizes and weights of the material.

HOISTS—Silent Hoist Winch & Crane Co., Brooklyn, N. Y., in a current bulletin features various types of its vertical and horizontal capstan winches and single and double-drum winches, with electric or gasoline drive. It is well illustrated to show a wide variety of uses.

Discounts and Extras

Steel Pipe

Pittsburgh and Lorain basing discounts, jobber's carloads.

Evanston, Ill., and Indiana Harbor, Ind., take differential 2 points less discount.

Chicago takes differential 2½ points less than Pittsburgh-Lorain basis.

Butt Weld

	Black	Galvanized
⅛-inch	45	19½
¼ and ⅜-inch	51	25½
½-inch	56	42½
¾-inch	60	48½
1 to 3-inch	62	50½

Lap Weld

2-inch	55	43½
2½ to 6-inch	59	47½
7 to 8-inch	56	43½
9 and 10-inch	54	41½
11 and 12-inch	53	40½

REAMED AND DRIFTED

Butt Weld

1 to 3-inch	60	48½

Lap Weld

2-inch	53	41½
2½ to 6-inch	57	45½

EXTRA STRONG—PLAIN ENDS

Butt Weld

⅛-inch	41	24½
¼ and ⅜-inch	47	30½
½-inch	53	42½
¾-inch	58	47½
1 to 1½-inch	60	49½
2 to 3-inch	61	50½

Lap Weld

2-inch	53	42½
2½ to 4-inch	57	46½
4½ to 6-inch	56	45½
7 to 8-inch	52	39½
9 and 10-inch	45	32½
11 and 12-inch	44	31½

DOUBLE EXTRA STRONG

Butt Weld

½-inch	42	32½
¾ to 1½-inch	45	35½
2 to 2½-inch	47	37½

Lap Weld

2-inch	41	32½
2½ to 4-inch	43	34½
4½ to 6-inch	42	33½
7 to 8-inch	38	25½

(Note—Large jobbers obtain additional preferential discounts of 1 and 5 on black and 1½ and 5 on galvanized. These preferentials increased by one extra 5 per cent in meeting competition.)

Wrought Iron Pipe

Pittsburgh basing discounts, jobbers' carloads. Individual quotations made on delivered basis.

THREADS AND COUPLINGS

Butt Weld

⅛ and ⅜-inch	+11	+39
½-inch	22	2
¾-inch	28	11
1 to 1½-inch	30	13

Lap Weld

1¼ and 1½-inch	Upon application	
2-inch	23	7
2½ to 3-inch	26	11
3 to 6-inch	28	13
7 to 12-inch	26	11

PLUGGED AND REAMED

Two points less than above

EXTRA STRONG, PLAIN ENDS

⅛ and ⅜-inch	+19	+54
½-inch	21	7
¾-inch	28	12
1 to 1½-inch	30	14

Lap Weld

2-inch	23	9
2½ to 4-inch	29	15
4½ to 6-inch	28	14
7 to 8-inch	21	7
9 to 12-inch	16	2

DOUBLE EXTRA STRONG

Butt Weld

½-inch	+47½	+59½
¾-inch	+28	+40
1-inch	+34	+46
1¼-inch	+28	+40
1½-inch	+27	+39

Lap Weld

2 and 2½-inch	+13	+25
3 and 4-inch	+ 8	+17
4½ to 6-inch	+ 9	+18
8-inch	+12	.....

(Note—Large jobbers obtain additional preferential discounts of 1, 5 and 5 on black and 1½ and 5 on galvanized.)

Boiler Tubes

Pittsburgh carload discounts. Less carloads 4 points less

STEEL (Lap Weld)

2 and 2¼-inch	27 off
2½ and 2¾-inch	37 off
3-inch	40 off
3¼ to 3¾-inch	42½ off
4 to 13-inch	46 off

(Note—Additional discounts of 5 to 7 extra 5 per cents now being given.)

CHARCOAL IRON

1½-inch	+18
1¾-inch	+ 8
2 and 2¼-inch	2 off
2½ to 3-inch	7 off
3¼ to 4½-inch	9 off

(Note—Additional discounts of one 10 to two 10's and one 5 now being given.)

SEAMLESS COLD DRAWN

1-inch	56 off
1¼ and 1½-inch	48 off
1¾-inch	32 off
2 and 2¼-inch	27 off
2½ and 2¾-inch	35 off
3-inch	41 off
3¼ and 3½-inch	43 off
4-inch	46 off
4½, 5 and 6-inch	41 off

SEAMLESS HOT ROLLED

2 and 2½-inch	30 off
2½ and 2¾-inch	38 off
3-inch	44 off
3¼ and 3½-inch	46 off
4-inch	49 off
4½, 5 and 6-inch	44 off

(Note—Additional discounts of 2 or 3 extra 5 per cents now being given.)

SEAMLESS STEEL MERCHANT BOILER TUBES

Extras:

Add $8 per ton for more than four gages heavier than standard and add 10 per cent to theoretical weight.

Add 5 per cent for lengths over 24 feet and not over 26 feet.

Smaller tubes than 1-inch and lighter than standard gage to be sold at mechanical tubing list and discount.

Intermediate sizes and gages not listed above take price of next larger outside diameter and heavier gage.

SEAMLESS STEEL MECHANICAL TUBING

Base Discounts on New List July 1, 1925

Carbon 0.10 to 0.30 per cent.....50 to 55 off
Carbon 0.30 to 0.40 per cent.....45 to 50 off

SEAMLESS STEEL LOCOMOTIVE AND SUPERHEATER TUBES

Net prices per foot f.o.b. Pittsburgh

Outside diameter	Gage	Price
2-inch	12-gage	14¼c
2-inch	11-gage	15c
2-inch	10-gage	16c
2¼-inch	12-gage	16c
2¼-inch	11-gage	17c
2¼-inch	10-gage	18c
3-inch	7-gage	33c
5⅝-inch	9-gage	50c
5½-inch	9-gage	52c

Plus usual extras for forming and for long lengths over 18 feet and for commercially exact lengths.

Plate Extras

BASE

Rectangular plates, tank steel or conforming to manufacturers' Standard Specifications for structural steel, dated Nov. 24, 1922, or equivalent, ¼-inch thick and over on thinnest edge, (except for ¼-inch or 72 inches wide when ordered to weight in pounds per square foot—see width and gage extras), 100 inches wide and under, down to but not including 6 inches wide, 5 feet 0 inches long up to published limit in length but not over 80 feet 0 inch, are base. Extras per pound for width or diameter.

All Plates Rectangular or Otherwise

¼-inch thick and heavier, but not less than 11 pounds per square foot, if ordered to weigh—

Over 100 inches to and including 110 inches	.05c
Over 110 inches to and including 115 inches	.10c
Over 115 inches to and including 120 inches	.15c
Over 120 inches to and including 125 inches	.25c
Over 125 inches to and including 128 inches	.50c

Plates less than ¼-inch or lighter than 11 pounds per square foot.

Over 72 inches to and including 84 inches	.10c
Over 84 inches to and including 96 inches	.20c
Over 96 inches to and including 100 inches	.30c

Over 100 inches add .35c to width extras for plates ¼-inch thick and heavier

GAGE

Plates not Exceeding 72 Inches Wide

Plates less than ¼-inch gage, to and including 3/16-inch; or lighter than 10 pounds per square foot, to and including 7.65 pounds per square foot	.20c

Plates over 72 Inches Wide

Plates less than ¼-inch gage, to and including 3/16-inch; or lighter than 11 pounds per square foot, to but not including 7.65 pounds per square foot,	.20c
Plates ordered 7.65 pounds per square foot	.30c

QUALITIES

Pressing steel	.10c
Flange steel (boiler grade)	.15c
Ordinary firebox steel	.20c
Stillbottom steel	.30c
Locomotive firebox steel	.50c
Marine steel	1.50c
Hull materials subject to U. S. Navy Dept. Specifications for Medium or Soft Steel	.10c
High tensile hull steel subject to U. S. Navy Dept. or equivalent specifications	1.00c
Boiler steel subject to U. S. Navy Dept. Specifications, classes A and B.	1.50c
Hull plates to hull specifications, required to stand cold flanging, take extra for flange steel.	

Floor Plates

Checkered plates	1.75c

Checkered plates are not furnished to sketch and are rolled from "Stock Steel" only. No physical tests will be made on checkered plates.

INSPECTION

Mill inspection .....No extra

Charles for other inspection, such as Lloyd's or American bureau of shipping, will be made by inspection bureau direct to buyer.

CUTTING

LENGTH OR DIAMETER

All Plates, Rectangular or Otherwise

Five feet and over up to published limit of length, but not over 80 feet....No extra

Under 5 feet to 3 feet inclusive	.10c
Under 3 feet to 2 feet inclusive	.25c
Under 2 feet to 1 foot inclusive	.50c
Under 1 foot	1.55c
Over 80 feet to 100 feet inclusive	.10c

Over 100 feet add .25c plus .05c for every additional 2 feet or fraction thereof.

Regular Sketches

With not more than four straight cuts. (Including straight taper plates)

Additional extra ..... .10c

Irregular Sketches

With not more than four straight cuts. (Sketches cannot be sheared with reentrant angles)

Additional extra ..... .20c